FINAL

ENGINEERING EVALUATION/COST ANALYSIS
NON-TIME-CRITICAL REMOVAL ACTION

INSTALLATION RESTORATION SITE 42
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

Contract No.: N68711-D-99-6620
Delivery Order No.: 0024

Prepared for:
Southwest Division
Naval Facilities Engineering Command
San Diego, California 92132-5190

December 22, 2005

Prepared by:
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REVIEW AND APPROVAL

MARRS Project Manager: Rod Reeve **Date:** 12/05
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EXECUTIVE SUMMARY

This Engineering Evaluation/Cost Analysis (EE/CA) has been prepared to support a non-time-critical removal action at Installation Restoration (IR) Program Site 42, Auto Shop Sump / Waste Oil Tank, Naval Weapons Station (NAVWPNSTA) Seal Beach. This EE/CA was conducted in accordance with current United States Environmental Protection Agency (EPA) and United States Department of the Navy (DON) guidance documents for a non-time-critical removal action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Chapter 6.8 of the *California Health and Safety Code* (Ca-HSC). This EE/CA describes site characteristics, removal action objectives, screening of technologies, removal action alternatives, and the recommended removal action alternative.

CERCLA, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 *Code of Federal Regulations* [C.F.R.] Part 300), and Ca-HSC § 25323 define removal actions as the cleanup or removal of released hazardous substances, actions to monitor the threat of release of hazardous substances, and actions to mitigate or prevent damage to public health/welfare or the environment. The NCP includes provisions for the "excavation, consolidation, or removal of highly contaminated soils from drainage or other areas – where such actions will reduce the spread of, or direct contact with, the "contamination" and "containment, treatment, disposal, or incineration of hazardous materials - where needed to reduce the likelihood of human, animal, or food chain exposure" (40 C.F.R. 300.415[e][6 and 8]).

IR Site 42 has two main areas of concern: 1) the 1,500-gallon oil-water separator east of Building 236 (Figure 1-1; Inset A); and 2) discharges to the National Wildlife Refuge (NWR) from a storm water collection basin drainpipe (Figure 1-1; Inset B). The maintenance shop oil-water separator began operation in 1978. It separates floatable oil from wastewater generated from Buildings 235 and 236. The 1,500-gallon capacity oil-water separator was removed in early 2004. The clarified wastewater discharges to a

sanitary sewer pipe. Also, in the vicinity of the oil-water separator, a storm water collection basin exists, that discharges through a drainpipe to the NWR.

The recommendation to undertake a removal action at IR Site 42 was based on the findings in the Focused Site Inspection (FSI) Phase II Report (CH2M Hill 2002). Results of the human-health and ecological screening risk assessments indicated that significant risk to ecological receptors from metals in soil, primarily copper, exists at IR Site 42. Human health risk screening was not evaluated due to incomplete pathways (asphalt pavement and saline waters of the salt marsh). It was concluded in the FSI Phase II Report (CH2M Hill 2002) that there is no human-health risk concern at IR Site 42.

Because the vertical extent of site contaminants in soil appears to be limited to the upper few feet below ground surface (bgs) and groundwater is approximately 7 to 15 feet bgs (CH2M Hill 2002), groundwater is not impacted. This proposed removal action focuses on soil.

This EE/CA identifies removal action alternatives to reduce the risk to ecological receptors from copper in soil at IR Site 42. After identification and screening of multiple removal technologies and process options, three alternatives were identified and considered:

- Alternative 1, no action;
- Alternative 2, partial removal with off-site disposal; and
- Alternative 3, excavation with off-site disposal.

Based on this analysis, the DON recommends Alternative 3, excavation with off-site disposal. This alternative best meets NCP criteria of overall protectiveness of human health; compliance with applicable or relevant and appropriate requirements; long-term effectiveness; reduction of mobility, toxicity, or volume through treatment; short-term effectiveness; implementability; cost; and state and community acceptance.

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ACRONYMS/ABBREVIATIONS

A-E	Architecture – Engineering
AOC	areas of concern
ARAR	applicable or relevant and appropriate requirement
bcy	bank cubic yard
bgs	below ground surface
BNI	Bechtel National, Inc.
Ca-HSC	California Health and Safety Code
Cal. Code Regs.	*California Code of Regulations*
Cal-EPA	California Environmental Protection Agency
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R.	*Code of Federal Regulations*
CNRSW	Commander Navy Region Southwest
COC	chemical of concern
COPC	chemical of potential concern
CRDL	contract required detection limit
CRQL	contract required quantitation limit
CTO	contract task order
DO	Delivery order
DON	Department of the Navy
DOT	Department of Transportation
DTSC	Department of Toxic Substances Control
EE/CA	engineering evaluation/cost analysis
EO	executive order
EPA	United States Environmental Protection Agency
°F	degrees Fahrenheit
FFSRA	Federal Facility Site Remediation Agreement
FSI	focused site inspection
IARC	International Agency for Research on Cancer
IR	Installation Restoration (Program)
JEG	Jacobs Engineering Group Inc.
lcy	loose cubic yards
MARRS	MARRS Services, Inc.

ACRONYMS/ABBREVIATIONS (CONT.)

µg/kg	micrograms per kilogram
MDL	method detection limit
mg/kg	milligrams per kilogram
NAVWPNSTA	Naval Weapons Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEESA	Naval Energy and Environmental Support Activity
NEPA	National Environmental Policy Act
NISZ	Newport-Inglewood structural zone
NWR	(Seal Beach) National Wildlife Refuge
O&M	operation and maintenance
OSHA	Occupational Safety and Health Administration
PAH	polynuclear aromatic hydrocarbon
PRG	preliminary remediation goal
QAPP	quality assurance project plan
QC	quality control
RAB	restoration advisory board
RAC	remedial action contractor
RACER	Remedial Action Cost Engineering and Requirements
RAO	removal action objective
RAP	remedial action plan
RAW	removal action work plan
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RWQCB	(California) Regional Water Quality Control Board
SCAQMD	South Coast Air Quality Management District
STLC	soluble threshold limit concentration
SVOC	semivolatile organic compound
SWDIV	Southwest Division Naval Facilities Engineering Command
SWMU	solid waste management unit
TBC	to be considered
TCLP	toxicity characteristic leaching procedure
TSS	total suspended solids
UCL	upper confidence limit
ULBV	upper limit background value

ACRONYMS/ABBREVIATIONS (CONT.)

USC	*United States Code*
USGS	United States Geological Survey
USFWS	United States Fish and Wildlife Service
VOC	volatile organic compound
WET	(Cal-EPA) Waste Extraction Test

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1.0 INTRODUCTION

This Engineering Evaluation/Cost Analysis (EE/CA) identifies and evaluates proposed removal action alternatives to address elevated copper concentrations in soil at Installation Restoration (IR) Program Site 42, Auto Shop Sump/Waste Oil Tank, Naval Weapons Station (NAVWPNSTA) Seal Beach, Orange County, California. MARRS Services Inc. (MARRS), prepared this document on behalf of the Department of the Navy (DON), Southwest Division Naval Facilities Engineering Command (SWDIV), Delivery Order (DO) 0024 under MARRS' Indefinite Quantity Contract for Architecture and Engineering (A-E) Services for Environmental Services for Potable Water, Groundwater, and Wastewater at Navy/Marine Corps Installations, contract number N68711-D-99-6620.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) define removal actions as "the cleanup or removal of released hazardous substances from the environment, such actions as may necessarily be taken in the event of the threat of release of hazardous substance into the environment, such action as may be necessary to monitor, assess, and evaluate the release or threat of release of hazardous substances, the disposal or removal of material, or the taking of such other actions as may be necessary to prevent, minimize, or mitigate damage to the public health/welfare or to the environment, which may otherwise result from a release or threat of release." The United States Environmental Protection Agency (EPA) has classified removal actions into three types—emergency, time-critical, and non-time-critical—based on the circumstances surrounding the release or threat of release. The proposed removal action at IR Site 42, which the DON has determined to be appropriate, will be non-time-critical because the on-site activities will be initiated more than 6 months after the planning period begins (40 *Code of Federal Regulations* [C.F.R.] 300.415[b][4]).

Additionally, the *California Health and Safety Code* (Ca-HSC) specifies the preparation of necessary documentation, which depends upon the costs of the removal action. Ca-HSC requires development of either a remedial action plan (RAP), for removal actions

that cost $1 million or more, or a removal action work plan (RAW), for removal actions that cost less than $1 million. Furthermore, Ca-HSC authorizes the California Environmental Protection Agency (Cal-EPA) Department of Toxic Substances Control (DTSC) to waive the RAP requirements, in favor of a RAW or a RAP-equivalent document, for removal actions when an "Imminent and/or Substantial Endangerment" determination exists. DTSC may also waive the RAP requirements of Ca-HSC Section 25356.1(d)(1)–(6) if a RAP-equivalent document that meets the requirements of Ca-HSC Section 25356.1(h)(3) is prepared. The proposed removal action for IR Site 42 will cost less than $1 million; therefore, the requirements for a RAW apply.

IR Site 42 is located at the corner of Net Road and Kitts Highway, adjacent to Building 236 (Figure 1-1). A portion of site is located within the NWR across Kitts Highway from Building 236. The land use at the site is considered industrial.

IR Site 42 has two main areas of concern: 1) the 1,500-gallon oil-water separator east of Building 236 (Figure 1-1; Inset A); and 2) discharges to the National Wildlife Refuge (NWR) from a storm water collection basin drainpipe (Figure 1-1; Inset B). The maintenance shop oil-water separator began operation in 1978 and was removed in early 2004. It separated floatable oil from wastewater generated from Buildings 235 and 236. The clarified wastewater discharged to a sanitary sewer pipe. Also, in the vicinity of the oil-water separator, a storm water collection basin exists, that discharges through a drainpipe to the NWR.

During the focused site inspection (FSI) Phase II, soil samples were collected and analyzed for volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), and metals; water samples were collected and analyzed for VOCs, semivolatile organic compounds (SVOCs), total and dissolved metals, and total suspended solids (TSS). Analytical results for these samples were used in ecological screening risk assessments.

Human health risk screening was not evaluated due to the following reasons (CH2M Hill 2002):

- The soil exposure pathway at IR Site 42 near Building 236 is incomplete because the asphalt pavement reduces the potential for direct contact with soils at the site and because the likelihood of humans entering the portion of IR Site 42 within the NWR is minimal; and
- The groundwater pathway is also considered incomplete because of the proximity of the site to the saline waters of the salt marsh.

It was concluded in the FSI Phase II Report (CH2M Hill 2002) that there is no human-health risk concern at IR Site 42, but there is significant ecological risk from metals. The primary risk driver is copper. The report recommended a removal action to reduce the risk to ecological receptors from copper concentrations in soil.

This EE/CA addresses the implementability, effectiveness, and cost for conducting a non-time-critical removal action and addresses applicable regulatory requirements. This EE/CA will be used as the basis for a future CERCLA removal action. The DON, with state regulatory oversight, is the lead agency for this non-time-critical removal action. As the lead agency, the DON has the final approval authority of the recommended alternative selected and overall public participation activities, with state of California concurrence. To implement this removal action, the DON is working in cooperation with the Cal-EPA DTSC and the California Regional Water Quality Control Board (RWQCB), Santa Ana Region.

This EE/CA is being issued in accordance with the Community Relations Plan prepared by NAVWPNSTA Seal Beach to facilitate public involvement in the decision-making process. The public is encouraged to review and comment on the proposed removal activities described in this EE/CA. There will be a formal 30-day comment period at the time this EE/CA is made available to the public. The DON will provide written responses to significant public comments submitted during this period.

Based on this EE/CA, an action memorandum will be prepared that incorporates regulatory and significant public comments. The action memorandum will provide a written record of the decision to select an appropriate removal action. As the primary decision document, the action memorandum substantiates the need for a removal action, identifies the proposed action, and explains the rationale for the removal action selection. This EE/CA and the action memorandum will also satisfy Ca-HSC's requirements for a removal action.

NAVWPNSTA Seal Beach has formed a restoration advisory board (RAB) as part of the community outreach effort associated with the IR Program. The RAB meets regularly to review IR documents and discuss restoration issues. The RAB is made up of members of the community representing diverse interests. Meetings are open to the public. A community co-chair is selected by the RAB members and serves for a designated period.

To gain a more thorough understanding of the activities associated with this proposed removal action and other NAVWPNSTA Seal Beach activities, the public can review documents contained in the information repositories. The information repositories are located at NAVWPNSTA Seal Beach, Building 110, and at the Seal Beach Public Library, Mary Wilson Branch, 707 Electric Avenue, Seal Beach, California 90740, telephone (562) 431-3584. The library hours (as of September 2001) are:

Monday and Tuesday:	12:00 Noon – 8:00 p.m.
Wednesday and Thursday:	10:00 a.m. – 6:00 p.m.
Saturday:	10:00 a.m. – 5:00 p.m.
Friday and Sunday:	Closed

Project documents are also available to the public through the Administrative Record. The complete Administrative Record is located at 1220 Pacific Highway, San Diego, California. It is maintained by Ms. Diane Silva, SWDIV Administrative Record Coordinator telephone (619) 532-3676.

2.0 SITE CHARACTERIZATION

This section includes descriptions of the facility and background, previous investigations, nature and extent of contamination, and risk-screening evaluation. The information for this site characterization was taken from the FSI Phase II Report (CH2M Hill 2002).

2.1 FACILITY DESCRIPTION AND BACKGROUND

NAVWPNSTA Seal Beach, located about 30 miles south of the Los Angeles urban center, consists of about 5,000 acres of land located on the Pacific Coast (Figure 2-1). NAVWPNSTA Seal Beach is part of the Commander Navy Region Southwest (CNRSW), and its major claimant is the Commander-In-Chief-Pacific Fleet. The station provides fleet combatants with ready-for-use ordnance. Because of its geographic location, the station serves as a supply point for the operating forces of the DON and Marine Corps forces in the Southern California region.

2.1.1 Site Location

IR Site 42 is approximately located at the corner of Net Road and Kitts Highway, adjacent to Building 236 (Figure 1-1). A portion of the site is located within the National Wildlife Refuge (NWR), across Kitts Highway from Building 236. The NWR boundary is 150 feet southeast of the site. The assumed study area for this site is about 250 feet by 100 feet.

2.1.2 Type of Facility and Operational Status

The areas of concern at the IR Site 42 are (1) the maintenance shop The oil-water separator which was removed in early 2004, was located east of the Building 236 (Figure 1-1; Inset A) and (2) the discharges to the NWR from the stormwater collection basin drainpipe (Figure 1-1; Inset B). The 1,500-gallon oil-water separator has been in operation since 1978 and separated floatable oil from wastewater from Buildings 235 and 236. Building 237 is used for waste oil storage and Building 236 as a wash area. The clarified wastewater from the oil-water separator discharged to a sanitary sewer pipe. A

stormwater collection basin that discharges though a drainpipe to the NWR also exists at the IR Site 42 (CH2M Hill 2002).

2.1.3 Topography/Structures

NAVWPNSTA Seal Beach is bordered on the southwest by Anaheim Bay and on the north, west and east by highly developed urban communities. The most pronounced topographic feature on NAVWPNSTA Seal Beach is Landing Hill on the western portion of the station.

Buildings 235, 236, and 237, lie within the IR Site 42. The portion of IR Site 42 near Building 236 is asphalt-paved and covered with gravel. There is no significant vegetation habitat at the site.

2.1.4 Geology/Soil Information

Most of the NAVWPNSTA Seal Beach lies on flat, alluvial deposits that slope evenly from approximately 20 feet above mean sea level in the northeastern part of the station to mean sea level in the tidal flats in the southwestern portion of the station.

Bedrock in the vicinity of the base is a thick sequence of Tertiary and Quaternary sedimentary rocks deposited on a basement of pre-Tertiary metamorphic and crystalline rocks. Tertiary rocks range in age from Oligocene to Pliocene and include sandstone, siltstone, shale, and mudstone. They are most exclusively of marine origin (CH2M Hill 2002).

NAVWPNSTA Seal Beach is located adjacent to the Pacific Ocean at the seaward edge of the Orange County Coastal Plain at the northwest corner of Orange County, California. The northwest-trending Newport-Inglewood structural zone (NISZ) underlies the southwestern half of NAVWPNSTA Seal Beach. The NISZ consists of a complex set of faults and folds that extend from Newport Beach approximately 10 miles southeast of NAVWPNSTA Seal Beach to Beverly Hills at the base of the Santa Monica Mountains, approximately 30 miles northwest of the station. Uplift along the NISZ has produced a

line of low coastal hills and mesas near the southern end and Landing Hill. On the east is Sunset Gap, a wetland comprising coastal salt marsh and tidal mudflats (BNI 2000).

The soils at NAVWPNSTA Seal Beach typically contain abundant clay and silt and are poorly drained. Six soil types (Alo clay, Beaches, Bolsa silt loam, Bolsa silt clay loam, Myford sandy loam, and tidal flats) have been identified at NAVWPNSTA Seal Beach. The soil at IR Site 42 consists of mostly clays and silts. Based on the topography of the station, the groundwater at the site is expected to be within a range of 7 to 15 feet bgs. The groundwater at the site is influenced by tides and is likely to be brackish (CH2M Hill 2002).

2.1.5 Surrounding Land Use and Populations

NAVWPNSTA Seal Beach, located in Orange County, is bordered by the city of Seal Beach on the north, west, and southwest; the city of Westminster on the northeast; the city of Huntington Beach on the southeast and south; and county land south of Edinger Avenue.

The predominant land use in the surrounding areas is medium-density residential development, with scattered parcels of high-density residential, commercial, industrial, and recreational development (JEG 1995). Future land uses for the adjacent cities include commercial/industrial, limited residential, and open space.

Explosive quantity distance arcs that restrict development to specific permitted uses cover approximately 75 percent of NAVWPNSTA Seal Beach. Two agricultural out-leases, totaling approximately 2,000 acres, are used for farming (irrigated and dry) and maintenance. Approximately 100 acres of land is currently being leased for oil production. In addition to the out-leased land, the National Wildlife Refuge (NWR), a major biological resource, encompasses approximately 900 acres of NAVWPNSTA Seal Beach. The NWR is an endangered species refuge established to preserve one of the largest remaining salt marshes in Southern California. It provides essential habitat for the California brown pelican, peregrine falcon, and Belding's Savannah sparrow. Areas

covered by the explosive quantity distance arcs overlap the agricultural out-lease areas and portions of the NWR.

Other land uses on NAVWPNSTA Seal Beach include residential; ordnance transfer operations; weapons production, evaluation, and quality assurance; storage (inert and explosive); and administration/community support.

Potable water is supplied to NAVWPNSTA Seal Beach by the city of Seal Beach. Non-potable water used for agricultural purposes is supplied by on-station agricultural wells with screen intervals between 140 feet and 600 feet bgs. Because of the distance of these wells from the site (nearest well is approximately 4,375 feet northeast of IR Site 42) and their screen intervals, contaminants at IR Site 42 are not expected to impact the water quality in these wells.

Approximately 2,175 feet northwest of IR Site 42 is the J. H. McGaugh Elementary School, located on the west side of Seal Beach Boulevard between Bolsa Avenue and Marlin Avenue. The area approximately 1,875 feet northeast of IR Site 42 is used for military housing.

2.1.6 Sensitive Ecosystems

The Sump Release Area at the IR Site 42 offers little to almost no exposure to the terrestrial ecological receptors because the area is paved with asphalt-concrete. However, the surface water at this site is discharged into the NWR, therefore, the receptors of concern are the aquatic ecological receptors present in the NWR.

Both ecological and terrestrial ecological receptors are of concern for the part of the site within the NWR. Ground squirrel, clapper rail and American kestrel are potential terrestrial ecological receptors within NWR.

2.1.7 Meteorology

The climate of the NAVWPNSTA Seal Beach area is typical of the Southern California coastal region. The adjacent Pacific Ocean has a moderating effect on temperatures. In the winter months, the maximum temperature usually ranges from the middle to high 50s (degrees Fahrenheit [^{o}F]). In the summer months, maximum temperatures in the high 70s and low 80s are common, while low temperatures vary between the high 50s and the mid 60s ^{o}F (NEESA 1987).

The Seal Beach coastal area has an average rainfall of 10 to 12 inches, with the greatest rainfall occurring during the winter months. Prevailing winds at the stations are from the west. Occasionally, strong, dry, northeasterly winds descend mountain slopes during fall, winter, and early spring months. During the winter months, Santa Ana wind conditions are common. Santa Ana winds occur when high pressure builds in the Great Basin area of Utah and Nevada. The clockwise circulation around the high-pressure system produces north-to-northeast winds, which can persist from several hours to a few days and reach sustained speeds of up to 60 miles per hour (JEG 1995). The highest winds at NAVWPNSTA Seal Beach were recorded in association with the winter and spring storms that invade southern California from the Pacific Ocean (NEESA 1987).

2.2 PREVIOUS REMOVAL ACTIONS AND INVESTIGATIONS

NAVWPNSTA Seal Beach and the DON have been actively engaged in the IR program. However, IR Site 42 has been recently added to the IR Program. There have been no previous removal actions taken at IR Site 42. The following summarizes the results of previous investigations conducted at IR Site 42.

In 1989, A.T. Kearney, Inc. performed a Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) at NAVWPNSTA Seal Beach. The RFA identified and evaluated solid waste management units (SWMUs) and other areas of concern (AOCs) at NAVWPNSTA Seal Beach. During the assessment, 69 SWMUs and nine

AOCs were identified. The RFA reported the oil-water separator at IR Site 42, referred to as SWMU No. 42 in the report, appeared intact, well constructed and had no signs of releases based on visual observations. The maintenance shop oil/water separator began operation in 1978 and was removed in early 2004. The RFA report concluded SWMU No. 42 has a low release potential for past and ongoing potentials to soil, groundwater, surface water, air, and subsurface gas.

Analysis on the soil sample collected adjacent to the Building 236 oil-water separator, at the depth of 5 feet bgs, showed an elevated level of lead (255 mg/kg). The presence of the drainpipe to the NWR suggested the sampling of the soils around the discharge point (SWDIV, 1999).

In 2002, CH2M Hill conducted a FSI Phase II at IR Site 42. The objective of the FSI Phase II was to determine the extent of VOCs, SVOCs and metals at the Sump Release Area. It also focused on studying the extent of VOCs, PAHs and metals within the NWR and to screen for ecological and human-health risks. Soil samples were taken at a depth of 0.5 foot and 2 feet bgs. The results and conclusions are as follows:

- Seven metals (arsenic, cadmium, copper, lead, mercury, nickel and zinc) were detected at concentrations above their respective upper limit background values (ULBVs). Most of the metal concentrations above ULBV were detected in the surface soil samples. All the maximum concentrations except one were detected at the mouth of the discharge pipe outlet in the NWR.

  Total aluminum, cobalt, copper, lead, nickel, vanadium, and zinc were detected in the groundwater samples at concentrations above their respective ULBVs. Dissolved vanadium and aluminum were detected above their respective ULBVs at the sampling points furthest from the NWR, whereas the sampling points nearest to the NWR did not detect these metals above ULBV.

- Three VOCs (1,1,1-trichloroethane, toluene, and p-xylene) were detected in the soil samples.

- Five VOCs (1,1,1-trichloroethane, 1,1-DCE, 1,1-DCA, acetone, and methylene chloride) were detected in the groundwater samples. These VOCs were all detected at the location nearest to the railway track and the NWR.

- The only SVOC detected in the groundwater was Bis(2-ethylhexyl)phthalate. Because it was the only SVOC detected, it is likely that it may have been because of the laboratory contamination.

- Ten PAHs were detected in the soil samples collected at the IR Site 42. The maximum concentrations were predominantly detected at the sampling point located at the mouth of the discharge pipe outlet in the NWR. All the PAHs were detected in the surface soil samples.

- Based on the human health risk screening there are no risk concerns from exposure to soil both in the Sump Release Area and the area within the NWR, because of the asphalt pavement and also the likelihood of humans entering the portion of IR Site 42 within the NWR is minimal. Also, because of the proximity of the site to the saline waters of the salt marsh, there is no potential risk from the groundwater.

- Based on ecological risk screening, the VOCs and metals detected in the groundwater in the sump release area do not present any significant risks. It was also concluded that PAHs and VOCs in the groundwater in the area within the NWR were at concentrations below the ecological preliminary remediation goals (PRGs). However, significant risk to terrestrial receptors exists from metals in soil. Safe ecological PRGs for most receptors are exceeded by the maximum concentrations of these metals and by the 95 percent upper confidence limit (UCL) concentration of copper. Copper is the primary contributor to risk at this site.

2.3 SOURCE, NATURE, AND EXTENT OF CONTAMINATION

The source and nature of contamination at IR Site 42 are from the vehicle maintenance activities performed at Buildings 235, 236 and 237. The storm water collection basin adjacent to the site discharges through a drainpipe to the NWR.

Metals were deposited to the NWR from the drainpipe. Several metals were detected above ULBVs in soil samples collected in the NWR. The metal detection in soil were mostly confined to a small area in the immediate vicinity of the drain outfall. Copper is the only metal that was detected at the two locations farthest from the drain outfall (CH2M Hill 2002). The extent of copper in soil at IR Site 42, based on analytical results from the FSI Phase II, is shown on Figure 2-3. The figure shows that copper

concentrations exceeding the stationwide ULBV of 39 mg/kg and ranging up to 172 mg/kg are confined to a small area in the vicinity of the drain outfall.

2.4 ANALYTICAL DATA

This section discusses analytical data from the FSI Phase II and summarizes data quality.

2.4.1 Presentation of Analytical Data

The temporary well points and the soil sampling stations were located at IR Site 42. Temporary well points were installed using a direct-push rig, and groundwater samples were collected using peristaltic pump. Surface soil samples were collected from 0.5 to 1.0 feet bgs and the subsurface soil samples were collected from 2.0 to 2.5 feet bgs. The soil samples were collected using a hand auger and a manually driven 6-inch sampler.

A total of ten (10) soil samples were collected to analyze metals, VOCs, and PAHs and three (3) groundwater samples were collected to analyze VOCs, SVOCs, and total metals. The summary statistics for the reported analytes are illustrated on Tables 2-1 and 2-2. A complete set of laboratory results can be found in the FSI Phase II Report, Appendix H (CH2M Hill, 2002).

2.4.2 Data Quality

The FSI Phase II Report was reviewed for data quality. In general, the information contained in the FSI Phase II Report was found to be of acceptable quality to adequately describe site conditions. EPA analytical methods were used for analysis of soil and groundwater samples. Field and laboratory quality control samples were analyzed at appropriate frequencies.

It was noted in the FSI Phase II Report that project chemists evaluated all analytical data independent of the laboratory. The data were reviewed for the quality control (QC) specifications identified in the project Quality Assurance Project Plan (QAPP) (SWDIV 2000) and were flagged in accordance with the project QAPP and EPA data validation functional guidance (EPA 1994). Raw data checks (i.e., laboratory instrument

output/bench record reviews for laboratory calculations, algorithms, and transcription errors) were carried out for approximately 10 percent of the data. Results of the data validation did not indicate significant issues regarding data quality. The data were found to meet the QAPP QC criteria for over 95 percent of the data (CH2M Hill 2002).

2.5 STREAMLINED RISK EVALUATION

The decision to proceed with a removal action at the site was based on the results of the ecological screening for soils and groundwater as part of a FSI Phase II (CH2M Hill 2002).

2.5.1 Previous Risk Evaluations and Findings

Human-health risk screening for IR Site 42 was not evaluated for the FSI Phase II for the lack of potential human health risk conerns. Ecological risk screening for soils and groundwater at IR Site 42 was performed as a part of a FSI Phase II (CH2M Hill 2002). The chemicals of potential concern (COPCs) that were evaluated were metals, VOCs, SVOCs and PAHs. Results of these risk assessments are summarized in Sections 2.5.1.1 and 2.5.1.2. Based on the human-health risk screening, there are no significant risks to human health from the COPCs at IR Site 42. Primarily, metals were found to be of ecological risk to the ecological terrestrials.

According to the NCP, eight factors must be considered in determining the appropriateness for a removal action. Conditions at IR Site 42 meet the following NCP requirement for a removal action (40 C.F.R. § 300.415 [b][2]): "actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances or pollutants or contaminants."

The proposed removal action will be conducted as a non-time-critical removal action because the on-site activities will be initiated more than 6 months after the planning period begins (40 C.F.R. § 300.415 [b] [4]).

2.5.1.1 Human-Health Risk Assessment

The human health risk screening for the FSI Phase II was not performed at IR Site 42. There are no potential human health risk concerns at IR Site 42 because:

- The Sump Release Area is asphalt paved. Therefore, it reduces the potential for direct contact of the soils with the humans. The likelihood of humans entering the portion of the site within the NWR is minimal; and
- Because of the proximity of the site to the saline waters of the salt marsh, there is no risk from the groundwater on human health.

2.5.1.2 Ecological Risk Assessment

A screening level ecological risk assessment was performed for contaminants present in the soil at IR Site 42. The VOCs, SVOCs and PAHs detected in the soil and groundwater samples at the site were below the ecological PRGs and do not present any risk to the ecological receptors. Maximum concentrations of seven metals (arsenic, cadmium, copper, lead, mercury, nickel, and zinc) exceeded the ULBVs in soil samples near the storm drain at IR Site 42. Maximum concentrations of cadmium, copper, lead and zinc also exceeded safe ecological PRGs for American kestrel and clapper rail. Highest concentrations of all metals were found in the immediate vicinity of the storm drain and, thus, do not pose any significant risks. The concentration of copper was the highest (172 mg/kg) at the storm drain, but did not show a consistent pattern. Therefore, copper appears to be a risk. The FSI Phase II Report (CH2M Hill 2002) recommended a cleanup goal for metals based on the possible ecological risks to aquatic and terrestrial receptors. It is also recommended that a removal action using a confirmation sampling approach to remove soils with metal concentrations above ULBV be used. As the removal action recommended at this site is within NWR, the United States Fish and Wildlife Service (USFWS) needs to be consulted. However, in accordance with CERCLA Section 121(e)(1), permits will not required.

2.5.2 Health and Environmental Effects of Copper and Threat to Nearby Human Populations and Environment

Copper is an essential nutrient required by the body in very small amounts. However, EPA has found copper to potentially cause the following health effects when people are exposed to it at levels above the action level for relatively short periods of time: stomach and intestinal distress, liver and kidney damage, and anemia. In addition, copper is a suspected cardiovascular or blood toxicant, a development toxicant, a gastrointestinal or liver toxicant, a reproductive toxicant and a respiratory toxicant. Persons with Wilson's disease may be more sensitive than others to the effects of copper contamination.

Copper is absorbed from the lungs or gastrointestinal tract following exposure. The highest tissue concentrations of copper are found in the brain, kidney, heart, liver, and pancreas. Copper appears to be excreted in the feces and at a constant rate by the kidneys. Acute poisoning from oral ingestion of copper is rare due to its emetic effect. There is no evidence that any copper compounds are carcinogenic. The International Agency for Research on Cancer (IARC) has not evaluated copper or copper compounds or carcinogenicity.

Copper in the soils at IR Site 42 does not pose a great risk to human health because the area near the sump release is asphalt-paved and the area within the NWR is not frequented by humans. Human health risk form the groundwater is also anticipated to be unlikely because of the brackish nature due to the proximity of the site to the saline waters of the salt marsh and tidal influence. However, copper in the soil in the area within the NWR does pose a significant risk to the aquatic and terrestrial ecological receptors.

2.5.3 Documented Exposure Pathways

The only receptors of potential concern are the following terrestrial ecological receptors that live on or otherwise use IR Site 42.

- The California ground squirrel has been observed in terrestrial habitats throughout NAVWPNSTA Seal Beach; it spends a high percentage of time

in the study area and its burrowing and foraging activities increase its chances of exposure from soilborne COPCs (CH2M Hill 2002).

- The American kestrel has also been observed in terrestrial habitats throughout NAVWPNSTA Seal Beach. Because the American kestrel is considered high on the food chain, its exposure potential to COPCs that biomagnify is increased through ingestion (CH2M Hill 2002).
- The clapper rail is considered a special-status species; as it has been observed in terrestrial habitats in the NWR at NAVWPNSTA Seal Beach. Because the clapper rail spends a high percentage of time in the study area, its exposure potential to COPCs is increased through ingestion of soil/sediments and invertebrates (CH2M Hill 2002).

2.5.4 Sensitive Populations

Although several terrestrial ecological receptors may occur at IR Site 42, the most significant terrestrial ecological receptor is the clapper rail. The Light-footed clapper rail and the California clapper rail are classified as endangered in California and are known to populate coastal saltmarshes from Santa Barbara County southward. The breeding season is from March through July. Potential populations of Light-footed Clapper Rail exist in the saltmarsh area to the east of IR Site 42.

3.0 IDENTIFICATION OF REMOVAL ACTION OBJECTIVES

This section identifies the removal action scope and objectives for IR Site 42. Removal action objectives (RAOs) are based on CERCLA, the NCP, sensitive ecosystems (Section 2.1.6), and chemical- and location-specific applicable or relevant and appropriate requirements (ARARs) (Section 3.4.2). These objectives were used to screen technologies and to develop removal action alternatives (Sections 4.0 and 5.0).

3.1 STATUTORY FRAMEWORK

This proposed removal action is taken pursuant to CERCLA and the NCP under the delegated authority of the Office of the President of the United States by Executive Order (EO) 12580. This order authorizes the DON to conduct and finance removal actions. This proposed removal action is non-time-critical because more than a 6-month planning period will have been available from the time the DON determined that a removal action was appropriate and the time that on-site activities will be initiated. Requirements for this EE/CA and its mandated public comment period provide opportunity for public input to the cleanup process.

Generally, this entire process is also governed by the Federal Facility Site Remediation Agreement (FFSRA). This site was designated as IR Site 42 after the FFSRA was signed in 1991 by the DON, DTSC (Department of Health Services at that time), and RWQCB and amended in August 1994. IR Site 42 will be included in a future version of the FFSRA when it is revised. In the interim, all activities related to IR Site 42 will be performed in accordance with the current FFSRA.

Additionally, Ca-HSC specifies required documentation, which depends upon the costs of the removal action. Ca-HSC requires development of either a RAP (i.e., for removal actions that cost $1 million or more) or a RAW (i.e., for removal actions that cost less than $1 million). DTSC may waive the RAP requirements in favor of a RAW for removal actions when an Imminent and/or Substantial Endangerment determination

exists. Furthermore, DTSC may also waive the RAP requirements if a RAP-equivalent document that meets the requirements of Ca-HSC Section 25356.1(h)(3) is prepared.

The DON, with state regulatory oversight, is the lead agency for the proposed removal action. As such, the DON has final approval authority over the recommended alternative and all public participation activities with state concurrence. SWDIV, as regional manager of the DON's CERCLA program, is providing technical expertise to NAVWPNSTA Seal Beach to conduct activities specific to the preparation of this EE/CA and the execution of the recommended alternative.

This EE/CA complies with the requirements of CERCLA, Superfund Amendments and Reauthorization Act, NCP at 40 C.F.R. Part 300, Defense Environmental Restoration Program at 10 *United States Code* Section 2701, et seq., and EO 12580. This EE/CA is considered appropriate based on the following factor under 40 C.F.R. Part 300.415(b)(2)(i): "actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants."

This EE/CA, along with the action memorandum, will also satisfy the Ca-HSC requirements for a removal action.

3.2 DETERMINATION OF REMOVAL SCOPE

The scope of this removal action is to reduce risk to ecological receptors from exposure to elevated copper concentrations in soil associated with the automobile maintenance activities at IR Site 42. The removal action alternatives considered in this EE/CA should make the site suitable for a determination that no further response action for CERCLA compliance is appropriate at IR Site 42 for the current land use. The area of concern at IR Site 42 is within the NWR boundary and future development of this area is unlikely. NAVWPNSTA Seal Beach is not slated for closure or changes in land use. The Navy will use the Base Master Plan to track and control changes in land use and determine the need for reassessment of human-health and/or ecological risk should the land use change. In addition, the National Environmental Policy Act (NEPA) review process is in place to

determine whether a site is adequate to be used for any purpose other than its current use. Should the planned use of IR Site 42 change in the future, analysis and documentation of historical land use and cleanup activities will be conducted in accordance with the NEPA provisions.

A project work plan will be prepared by the remedial action contractor (RAC) to implement the final alternative selected by the DON. The project work plan will describe planning and design to facilitate the proposed removal action, including a confirmation sampling program for copper. A project report will be prepared to document the removal action activities, which will provide the basis of a decision for no further action is recommended following the removal.

3.3 DETERMINATION OF REMOVAL SCHEDULE

There are neither anticipated weather-related restrictions nor availability-of-services restrictions expected to impact the removal schedule. This EE/CA, which will be available for public review and agency comment for a minimum of 30 days, identifies and recommends a removal action alternative. The DON will review and prepare written responses to significant public comments, which will be included in the Final EE/CA (Appendix C).

3.4 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The NCP states, "Removal actions . . . shall to the extent practicable considering the exigencies of the situation, attain applicable or relevant and appropriate requirements under federal environmental or state environmental or facility citing laws" (40 C.F.R. 300.415[j]).

The evaluation of ARARs for this EE/CA is included as Appendix A. The following subsections provide an overview of the ARARs process and a summary of ARARs that potentially affect the development of RAOs.

3.4.1 ARARs Overview

Identification of ARARs is a site-specific determination that involves a two-part analysis. First, it must be determined whether a given requirement is applicable. Then, if it is not applicable, it must be determined whether the requirement is relevant and appropriate. A requirement is deemed applicable if the specific terms of the law or regulation directly address the COCs, removal action, or place involved at the site. If the jurisdictional prerequisites of the law or regulation are not met, a legal requirement may, nonetheless, be relevant and appropriate if site circumstances are sufficiently similar to circumstances in which the law otherwise applies and the requirement is well suited to the conditions of the site.

A requirement must be substantive to constitute an ARAR for activities conducted on-site. Procedural or administrative requirements (e.g., permits and reporting requirements) are not ARARs.

In addition to ARARs, NCP provides that where ARARs do not exist, agency advisories, criteria, or guidance are "to be considered" (TBC) useful "in helping to determine what is protective at a site or how to carry out certain actions or requirements" (55 *Federal Register* 8745). The NCP preamble states, however, that provisions in the TBC category "should not be required as cleanup standards because they are, by definition, generally neither promulgated nor enforceable, so they do not have the same status under CERCLA as do ARARs."

As the lead federal agency, the DON has the primary responsibility for the identification of federal ARARs relevant for IR Site 42. As the lead state agency, DTSC has the responsibility for identifying state ARARs.

The DON formally requested state chemical-specific, location-specific, and action-specific ARARs for IR Site 42. A letter dated August 3, 2004 was sent to DTSC. Following the DON solicitation for ARARs from DTSC, DTSC requested ARARs from

other state and local agencies. DTSC issued a letter to the DON dated October 7, 2004 with correspondence regarding the ARARs solicitation from the following agencies:

- California Regional Water Quality Control Board, Santa Ana Region;
- California Department of Fish and Game;
- South Coast Air Quality Management District;
- California Air Resources Board; and
- City of Seal Beach Environmental Quality Control Board.

Requirements of ARARs and TBCs are generally divided into three categories: chemical-specific, location-specific, and action-specific requirements. Chemical-specific and location-specific ARARs affecting the development of RAOs are discussed in the following section. Other chemical-specific, location-specific, and action-specific ARARs are presented in Section 5.0 for each alternative considered. Appendix A includes a detailed discussion of all ARARs considered for this EE/CA.

3.4.2 ARARs Affecting Removal Action Objectives

ARARs have been identified for each chemical, location, and removal action alternative (Appendix A). The substantive provisions of the following chemical- and location-specific requirements may impact the development of the RAOs:

- Resource Conservation and Recovery Act (RCRA) hazardous waste requirements at Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100;
- Characterization of solid waste as toxic based on toxicity characteristic leaching procedure (TCLP) at 40 C.F.R. 261.24(a) and Cal. Code Regs. tit. 22, § 66261.24(a)(1)(B);
- Protection of Wetlands, Executive Order 11990;
- Floodplain Management, Executive Order 11988;
- Endangered Species Act of 1973, 16 U.S.C 1531-1543;
- Migratory Bird Treaty Act of 1972, 16 U.S.C. 703-712;

- National Wildlife Refuge System Administration Act of 1966, 16 U.S.C 668dd-668ee;
- California Endangered Species Act, Cal. Fish and Game Code Section 2080;
- Cal. Fish & Game Code § 2080 regarding the protection of endangered species habitat;
- Cal. Fish & Game Code § 3005(a) regarding the taking of birds and mammals;
- Cal. Fish & Game Code § 3511 regarding the taking of fully protected birds; and
- Cal. Fish & Game Code § 3503(a) regarding the protection of nest(s) and egg(s) of any bird.

3.5 REMOVAL ACTION OBJECTIVES

Based on CERCLA, the NCP, the risk assessment in the FSI Phase II, and ARARs, the RAOs are as follows:

- minimize further migration of metal contaminants into the NWR area at IR Site 42;
- reduce risk to ecological receptors from copper-impacted soil to acceptable levels; and
- minimize impact to and preserve existing beneficial uses of the NWR.

The RAO were based on the stationwide ULBVs stated in the FSI Phase II Report (CH2M Hill 2002). The proposed cleanup goal for copper in soil is 39 mg/kg.

4.0 IDENTIFICATION AND SCREENING OF TECHNOLOGIES

Before the removal alternatives were developed, general response actions were determined based on the RAOs. The primary RAO for IR Site 42 is to reduce the risk to ecological receptors from exposure to copper-impacted soil and sediment to acceptable levels. Disturbance of natural wildlife resources should also be minimized to the extent practicable. Technologies and process options correlating with the general response action categories were then identified and screened for effectiveness, implementability, and cost. The retained technologies and process options were assembled into the removal alternatives that are described and evaluated in Section 5.0.

4.1 GENERAL RESPONSE ACTIONS

For this effort, five general response action categories were considered: no action, engineering controls, treatment, excavation/backfilling, and disposal.

- **No action** entails no further response action of any type, including administrative controls and monitoring.
- **Engineering controls** reduce potential hazards by limiting exposure to the site through physical controls (e.g., fencing). This type of response action does not reduce the level of contamination on-site.
- **Treatment** involves *in situ* or *ex situ* treatment to either chemically alter contaminants to less harmful by-products or physically alter the contaminated media (e.g., electrokinetic remediation, or solidification/stabilization).
- **Partial excavation/backfilling** involves removing contaminated soil using mechanical equipment. Following excavation, the area would be backfilled with clean soil, returned to original grade, and revegetated, if applicable.
- **Excavation/backfilling** involves removing contaminated soil using mechanical equipment. Following excavation, the area would be

backfilled with clean soil, returned to original grade, and revegetated, if applicable.

- **Disposal** involves the transfer and disposition of excavated soil to an on- or off-site location.

4.2 SCREENING OF TECHNOLOGIES AND PROCESS OPTIONS

Technologies were identified based on general response action categories (Section 4.1). For each technology, representative process options were selected. The process options were screened against the general criteria listed in Section 4.3. Table 4-1 lists removal technologies and process options identified for the screening process and summarizes the results. The technology categories screened are:

- no action;
- access restrictions;
- physical/chemical treatment;
- partial excavation;
- excavation;
- backfilling;
- on-site disposal; and
- off-site disposal.

4.3 SCREENING CRITERIA

Removal action technologies were screened following EPA technical guidance (EPA 1988). Process options that were retained following this screening evaluation were assembled into removal action alternatives that were also screened for effectiveness, implementability, and cost in Section 5.0.

4.3.1 Effectiveness

This evaluation criterion emphasizes each process option's performance and capability to meet RAOs. To evaluate the effectiveness of the process options, consideration was given to 1) overall protection of human health and the environment; 2) compliance with

ARARs; 3) long-term effectiveness; 4) reduction of toxicity, mobility, or volume of contaminants; and 5) short-term effectiveness. The less effective process options from each technology group may be eliminated. Process options that do not provide adequate protection of human health and the environment may also be eliminated from further consideration.

4.3.2 Implementability

This evaluation criterion considers the relative ease to implement a process option. This would include consideration of technical feasibility, commercial availability of materials and equipment, and availability of the technology. Other factors would be availability of skilled labor, logistical considerations, and state and/or community acceptance. Process options that are technically or administratively infeasible or that would require equipment, specialists, or facilities that are not available within a reasonable period of time may be eliminated from further consideration.

4.3.3 Cost

Process options were evaluated based on qualitative costs. Process options with lower costs were preferred if the effectiveness and implementability criteria were judged to be similar.

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5.0 IDENTIFICATION AND ANALYSIS OF REMOVAL ACTION ALTERNATIVES

Based on the RAOs presented in Section 3.0 and the results of the technology screening in Section 4.0, three alternatives were identified for the removal action at IR Site 42:

- Alternative 1, no action
- Alternative 2, partial removal with off-site disposal
- Alternative 3, excavation with off-site disposal

Because this proposed removal action only addresses risk to ecological receptors and soil at or near the ground surface, the majority of the technologies considered were eliminated in the technology-screening stage. The no action alternative is evaluated for comparison purposes only. The three alternatives are described and evaluated based on effectiveness, implementability, and cost in the following sections.

Section 4.2 presents some of the factors considered under each screening criterion. To evaluate the effectiveness of the removal alternatives, additional consideration was given to the overall protection of human health and the environment, compliance with ARARs and other guidance, and the long- and short-term effectiveness. Evaluation of the implementability of the removal alternative included consideration of the technical feasibility, commercial availability, administrative feasibility, and public acceptance. Cost evaluation of the removal alternatives was based primarily on estimates calculated using the Remedial Action Cost Engineering and Requirements (RACER) system developed by the U.S. Air Force. Appendix B provides supporting cost information.

5.1 ALTERNATIVE 1, NO ACTION

This alternative is included for comparison purposes only. It does not include any action to remove or prevent exposure to copper-impacted soil.

5.1.1 Effectiveness

This alternative would not reduce the risk of exposure to contaminated soil at the site and would not meet the proposed RAO. Toxicity, mobility, and volume of copper would not be reduced. The, no action alternative does not activate ARARs.

5.1.2 Implementability

This alternative is technically feasible because it requires no action. However, this alternative is expected to be unacceptable to the state and the public.

5.1.3 Cost

No costs are associated with this alternative.

5.2 ALTERNATIVE 2, PARTIAL REMOVAL WITH OFF-SITE DISPOSAL

Alternative 2 involves the excavation of soil 'hotspots' which contain copper at concentrations above the proposed cleanup goal of 39 mg/kg. Alternative 2 consists of the excavation of copper-impacted soil by mechanical means.

Under this alternative, it is assumed that the excavated soil will be transported and disposed of at an appropriate permitted landfill. The excavation will be backfilled with clean, imported soil and restored to original conditions.

5.2.1 Description

Under Alternative 2, soil with copper concentrations above the proposed cleanup goal would be excavated and disposed of at a permitted landfill.

Contaminated soil would be excavated 5 feet in each direction (following the general streamline) from each soil boring location exceeding the proposed cleanup goal and to a depth of 3 feet bgs (Figure 2-3).

5.2.1.1 Excavation

Based on current analytical data and interpretation of the extent of soil contamination (Section 2.3), approximately 45 bank cubic yards (bcy) (in-place soil volume) would be excavated at IR Site 42. Excavation and removal of the contaminated soil would be performed using standard construction equipment (e.g., backhoes and front-end loaders). Although not expected, dust monitoring would be initiated if considered necessary. In addition, it is not anticipated that excavation activities would be required in close proximity to the railway or Kitts Highway. If this should change, provisions would have to be made to ensure the integrity of the railway easement and Kitts Highway are not compromised.

5.2.1.2 Confirmation Soil Sampling

Confirmation sampling would not be collected for this alternative. This alternative assumes that the data collected during the FSI Phase II (CH2M Hill 2002) to be conclusive about the area impacted by copper contaminants.

5.2.1.3 Backfilling and Compaction

The excavation will be backfilled with clean fill material and compacted to original grade.

5.2.1.4 Soil Profiling and Disposal

Excavated soils would be stockpiled in a bermed area lined with plastic tarp. The stockpiles will be covered with plastic tarp until it can be sampled and classified for appropriate disposal. The plastic tarp used will be a minimum thickness of 20-mil. The liquids collected within the bermed area will be transferred to a storage container (i.e. Baker tank) at the site until it can be sampled and classified for appropriate disposal.

Approximately every 125 loose cubic yards (lcy) of stockpiled soil would be analyzed for total metals and leaching potential of metals using TCLP EPA Method 1311 (lcy is defined as a 25-percent swell factor of the soil once it is removed from the excavation).

This quantity may also be analyzed for contaminant soluble threshold limit concentration (STLC) values using Cal-EPA waste extraction test (WET) methods. Soil would be transported and disposed at an EPA-certified disposal facility. A water stabilizing additive such as lime kiln dust maybe mixed with the excavated material prior to transportation off-site. The addition of the water stabilizer will be determined by the RAC contractor.

5.2.2 Effectiveness

Alternative 2 is considered to be reliable and effective but some residual copper contaminated soil may be left in-place at the site. Specific discussion of the effectiveness of this alternative is provided in the following sections.

5.2.2.1 Compliance with ARARs

This alternative would comply with all identified ARARs. The primary ARARs for Alternative 2 include the following:

- Resource Conservation and Recovery Act (RCRA) hazardous waste requirements at Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100;
- Characterization of solid waste as toxic based on TCLP at 40 C.F.R. 261.24(a) and Cal. Code Regs. tit. 22, § 66261.24(a)(1)(B);
- Cal. Fish & Game Code § 3005(a) regarding the taking of birds and mammals;
- Cal. Fish & Game Code § 3503 prohibits the take or needless destruction of the nest or eggs of any bird;
- Cal. Fish & Game Code § 3511 prohibits the take or possession of fully protected birds; Cal. Fish & Game Code § 5650 regarding the discharge of toxic materials into state waters;
- RCRA on-site waste generation at Cal. Regs. tit.22, §§ 66262.10(a), 66262.11.11, 66264.13(a) and (b);
- RCRA hazardous waste accumulation requirements at Cal. Code

Regs. tit.22, §§ 66262.34;

- RCRA drip pad design at Cal. Regs. tit.22, §§ 66265.443, 66265.444, and 66265.445;
- SAQMD Rule 403;
- Floodplain Management, Executive Order 11988 and;
- National Wildlife Refuge System Administration Act of 1966, 16 U.S.C 668dd-668ee.

5.2.2.2 Long-Term Effectiveness

Alternative 2 would be effective, but since residual copper contaminated soil could remain after the proposed removal action, potential risk to ecological receptors from copper may exist. Although implementation of Alternative 2 would temporarily disrupt the local environment, the site would be restored to its original state in a relatively short period of time by placing clean backfill in the excavation and compacted to original grade.

Under Alternative 2, for excavated soil disposition, waste handling and landfilling technology is well developed. However, off-site disposal of soil classified as hazardous waste cannot be considered permanent remediation of the contaminated material because the excavated soil would not be treated to reduce copper concentrations. There would be some degree of uncertainty regarding potential future liability if excavated soil were to be disposed of as hazardous waste at an off-site facility.

5.2.2.3 Reduction of Toxicity, Mobility, and Volume

Alternative 2 would reduce toxicity at the site by physically removing soil impacted by copper at concentrations that may present unacceptable risk to ecological receptors. Excavation and removal of copper-impacted soil would also effectively reduce the potential mobility and volume of contaminants at the site.

5.2.2.4 Short-Term Effectiveness

According to EPA guidance, the short-term effectiveness criterion addresses the effects of the alternative during implementation before the removal objectives have been met (EPA 1993). The primary considerations of this criterion are protection of the community, protection of workers, and environmental impacts that occur during implementation and until the proposed removal action is completed.

Potential exposure and protection procedures for workers engaged in construction activities would be addressed in the Site-Specific Safety and Health Plan. During excavation activities, measures would be taken to reduce fugitive dust emissions, if encountered, and the associated impacts on workers. All workers within the work zone would wear appropriate safety equipment and take appropriate safety measures.

Heavy equipment would conform to Occupational Safety and Health Administration (OSHA) specifications. Excavation areas, soil stockpile areas, and other work areas would be properly delineated to limit access to authorized personnel. Only authorized and trained personnel would operate the heavy equipment.

Some or all of the following safety measures will be implemented to limit short-term risks during off-site transportation of the material. The trucks may be covered with tarps and their load height limited. Truck traffic could be limited to daylight, off-peak hours. Emergency spill containment and cleanup contingency planning should also be incorporated into the project work plan to minimize the potential of exposure to impacted soil from traffic-related accidental spillage.

5.2.3 Implementability

This alternative can be readily implemented at areas where no surface structures are located. The following subsections further discuss the implementability of this alternative.

5.2.3.1 Technical Feasibility

Alternative 2 is technically feasible and does not require special techniques, material, permits, or labor for excavation. Conventional earth-moving equipment can be used during the mechanical excavation, off-site disposal activities, and backfilling of the excavation. The site is accessible and relatively flat. In addition, if subsurface utilities are encountered, they will be temporarily rerouted during excavation and then restored after completion of the proposed removal action.

The actual volume of soil that can be feasibly excavated would be contingent on field conditions, including foundation considerations, utilities, pipes, and other subsurface features. Depth to groundwater, approximately 7 to 15 feet bgs, is not expected to be a factor during excavation activities. Excavation would be conducted in a manner that assures worker safety.

5.2.3.2 Administrative Feasibility

Under CERCLA, only substantive provisions of requirements identified as ARARs apply to actions conducted on-site. Administrative or procedural requirements, such as permits, are not required. However, because this alternative may involve the handling of hazardous waste off-site, administrative requirements and regulations, such as DOT hazardous waste manifests must be met. Alternative 2 is considered administratively feasible.

5.2.3.3 Availability of Services and Materials

The removal of contaminated soil by excavation is accomplished by using a variety of conventional and readily available equipment, such as backhoes and front-end loaders. This alternative can be implemented using standard transportation and disposal practices. Skilled workers, equipment, and material are readily available.

Several EPA-certified disposal facilities are located in California and Utah. These facilities will accept RCRA hazardous waste, Cal-EPA non-RCRA hazardous waste,

nonhazardous waste, and inert material. Transportation of the contaminated soil to these facilities would be provided by an appropriately licensed waste-hauling company.

5.2.3.4 State and Community Acceptance

It is anticipated that Alternative 2 will receive acceptance from the state regulatory agencies and the local community. State and community concerns will be addressed following the public comment period and review of the EE/CA by the RAB, Cal-EPA, DTSC, RWQCB Santa Ana Region, and the California Integrated Waste Management Board. Limitations arising from public comments and state review were considered at that time.

5.2.4 Cost

The cost estimates for Alternative 2 were developed based on the estimated extent of soil containing copper at concentrations above the cleanup goal (Section 3.5). A project start date of August 2005 and project duration of 1 month were assumed for the cost estimate. The cost evaluation is based on estimates for capital costs and includes costs for design, construction, equipment, and mobilization. There are no annual operations and maintenance costs. Table 5-1 describes the major cost items and the estimated costs. Appendix B contains supporting cost information.

The cost estimate was performed using the RACER system developed by the U.S. Air Force. RACER cost models are based on generic engineering solutions for environmental projects, technologies, and processes. These solutions are derived from historical project information, government laboratories, construction management agencies, vendors, contractors, and engineering analysis. During implementation of this removal alternative, cost savings may be accomplished by using clean, on-station fill materials generated during other removal/remedial actions, if available.

This cost estimate is for guidance in project evaluation and implementation. It was prepared from information available at the time of publication. The final cost of the project will depend on actual labor and material costs, actual site conditions, productivity,

competitive market conditions, final project scope, final project schedule, the company selected for final project implementation, and other variable factors. As a result, the final project cost would vary from the estimates presented herein. The final project cost would also depend on the actual volume of soil removed.

5.3 ALTERNATIVE 3, EXCAVATION WITH OFF-SITE DISPOSAL

Alternative 3 involves the excavation of soil containing copper at concentrations above the proposed cleanup goal of 39 mg/kg. Alternative 3 consists of the excavation of copper-impacted soil by mechanical means.

Under this alternative, it is assumed that the excavated soil will be transported and disposed of at an appropriate permitted landfill. The excavation will be backfilled with clean, imported soil and restored to original conditions.

5.3.1 Description

Under Alternative 3, soil with copper concentrations above the proposed cleanup goal would be excavated in lifts and disposed of at a permitted landfill.

Contaminated soil would be excavated from the drainage ditch to 12 feet beyond the furthest soil borings as identified on Figure 2-3. The excavation would be 12 feet wide, and to a depth of 1 foot bgs. The two galvanized gutters, one on the western end and the other in the center of the ditch, would be demolished and replaced by concrete gutters. The eastern most galvanized gutter would be demolished and a concrete gutter would be installed 10 to 15 feet west of its original location.

5.3.1.1 Excavation

Based on current analytical data and interpretation of the extent of soil contamination (Section 2.3), approximately 82 bank cubic yards (bcy) (in-place soil volume) would be excavated at IR Site 42. Excavation and removal of the contaminated soil would be performed using standard construction equipment (e.g., backhoes and front-end loaders). Although not expected, dust monitoring would be initiated if considered necessary. In

addition, it is not anticipated that excavation activities would be required in close proximity to the railway or Kitts Highway. If this should change, provisions would have to be made to ensure the integrity of the railway easement and Kitts Highway are not compromised.

5.3.1.2 Confirmation Soil Sampling

Confirmation sampling would be performed to establish concentrations of copper for soil remaining in place after excavation has been completed. The field sampling design, including proposed locations of confirmation samples, would be included in the project work plan prepared by the RAC. Final confirmation sampling locations would be recorded using surveying techniques. For cost-estimating purposes, it was assumed that one confirmation sample will be collected for every 20 linear feet along each sidewall and every 10 feet along the bottom floor. Approximately 65 confirmation samples would be collected from around the base and perimeter of the excavation. It is assumed that the confirmation samples will be analyzed for total copper using EPA Method 6010B or 6020.

Analytical results for confirmation sampling would be compared to the proposed cleanup goal. Based on this comparison, a decision to terminate excavation, if feasible, would be made. Additional confirmation sampling would be required if the decision were made to continue excavation.

5.3.1.3 Backfilling and Compaction

When the results of the confirmation sample analyses indicate that the soil containing copper at concentrations exceeding the proposed cleanup goal has been removed, the excavation would be backfilled with clean fill material and compacted to original grade.

5.3.1.4 Soil Profiling and Disposal

Excavated soils would be stockpiled in a bermed area lined with plastic tarp. The stockpiles will be covered with plastic tarp until it can be sampled and classified for appropriate disposal. The plastic tarp used will be a minimum thickness of 20-mil. The

liquids collected within the bermed area will be transferred to a storage container (i.e. Baker tank) at the site until it can be sampled and classified for appropriate disposal.

Approximately every 125 loose cubic yards (lcy) of stockpiled soil would be analyzed for total metals and leaching potential of metals using TCLP U.S. EPA Method 1311 (lcy is defined as a 25-percent swell factor of the soil once it is removed from the excavation). This quantity may also be analyzed for contaminant soluble threshold limit concentration (STLC) values using Cal-EPA waste extraction test (WET) methods. Soil would be transported and disposed at an EPA-certified disposal facility.

A water stabilizing additive such as lime kiln dust may be mixed with the excavated material prior to been transferred off site. The addition of the water stabilizer will be determined by the RAC contractor.

5.3.2 Effectiveness

Alternative 3 is considered to be reliable and effective. Specific discussion of the effectiveness of this alternative is provided in the following sections.

5.3.2.1 Compliance with ARARs

This alternative would comply with all identified ARARs. The primary ARARs for Alternative 3 include the following:

- Resource Conservation and Recovery Act (RCRA) hazardous waste requirements at Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100;
- Characterization of solid waste as toxic based on TCLP at 40 C.F.R. 261.24(a) and Cal. Code Regs. tit. 22, § 66261.24(a)(1)(B);
- Cal. Fish & Game Code § 3005(a) regarding the taking of birds and mammals;
- Cal. Fish & Game Code § 3503 prohibits the take or needless destruction of the nest or eggs of any bird;

- Cal. Fish & Game Code § 3511 prohibits the take or possession of fully protected birds; Cal. Fish & Game Code § 5650 regarding the discharge of toxic materials into state waters;
- RCRA on-site waste generation at Cal. Regs. tit.22, §§ 66262.10(a), 66262.11.11, 66264.13(a) and (b);
- RCRA hazardous waste accumulation requirements at Cal. Code Regs. tit.22, §§ 66262.34;
- RCRA drip pad design at Cal. Regs. tit.22, §§ 66265.443, 66265.444, and 66265.445;
- SAQMD Rule 403;
- Floodplain Management, Executive Order 11988 and;
- National Wildlife Refuge System Administration Act of 1966, 16 U.S.C 668dd-668ee.

5.3.2.2 Long-Term Effectiveness

Alternative 3 would be very effective over the long term. All copper-impacted soil above the cleanup goal would be removed from the area. This would reduce the potential risk to ecological receptors from copper in soil at the site. Although implementation of Alternative 3 would temporarily disrupt the local environment, the site would be restored to its original state in a relatively short period of time by placing clean backfill in the excavation and compacted to original grade.

Under Alternative 3, for excavated soil disposition, waste handling and landfilling technology is well developed. However, off-site disposal of soil classified as hazardous waste cannot be considered permanent remediation of the contaminated material because the excavated soil would not be treated to reduce copper concentrations. There would be some degree of uncertainty regarding potential future liability if excavated soil were to be disposed of as hazardous waste at an off-site facility.

5.3.2.3 Reduction of Toxicity, Mobility, and Volume

Alternative 3 would reduce toxicity at the site by physically removing soil impacted by copper at concentrations that may present unacceptable risk to ecological receptors. Excavation and removal of copper-impacted soil would also effectively reduce the potential mobility and volume of contaminants at the site.

5.3.2.4 Short-Term Effectiveness

According to EPA guidance, the short-term effectiveness criterion addresses the effects of the alternative during implementation before the removal objectives have been met (EPA 1993). The primary considerations of this criterion are protection of the community, protection of workers, and environmental impacts that occur during implementation and until the proposed removal action is completed.

Potential exposure and protection procedures for workers engaged in construction activities would be addressed in the Site-Specific Safety and Health Plan. During excavation activities, measures would be taken to reduce fugitive dust emissions, if encountered, and the associated impacts on workers. All workers within the work zone would wear appropriate safety equipment and take appropriate safety measures.

Heavy equipment would conform to OSHA specifications. Excavation areas, soil stockpile areas, and other work areas would be properly delineated to limit access to authorized personnel. Only authorized and trained personnel would operate the heavy equipment.

If soil transport by truck is considered necessary, some or all of the following safety measures will be implemented to limit short-term risks. The trucks may be covered with tarps and their load height limited. Truck traffic could be limited to daylight, off-peak hours. Emergency spill containment and cleanup contingency planning should also be incorporated into the project work plan to minimize the potential of exposure to impacted soil from traffic-related accidental spillage.

5.3.3 Implementability

This alternative can be readily implemented at areas where no surface structures are located. The following subsections further discuss the implementability of this alternative.

5.3.3.1 Technical Feasibility

Alternative 3 is technically feasible and does not require special techniques, material, permits, or labor for excavation. Conventional earth-moving equipment can be used during the mechanical excavation, off-site disposal activities, and backfilling of the excavation. The site is accessible and relatively flat. In addition, if subsurface utilities are encountered, they will be temporarily rerouted during excavation and then restored after completion of the proposed removal action.

The actual volume of soil that can be feasibly excavated would be contingent on field conditions, including foundation considerations, utilities, pipes, and other subsurface features. Depth to groundwater, approximately 7 to 15 feet bgs, is not expected to be a factor during excavation activities. Excavation would be conducted in a manner that assures worker safety.

5.3.3.2 Administrative Feasibility

Under CERCLA, only substantive provisions of requirements identified as ARARs apply to actions conducted on-site. Administrative or procedural requirements, such as permits, are not required. However, because this alternative may involve the handling of hazardous waste off-site, administrative requirements and regulations, such as DOT hazardous waste, manifests, must be met. Alternative 3 is considered administratively feasible.

5.3.3.3 Availability of Services and Materials

The removal of contaminated soil by excavation is accomplished by using a variety of conventional and readily available equipment, such as backhoes and front-end loaders.

This alternative can be implemented using standard transportation and disposal practices. Skilled workers, equipment, and material are readily available.

Several EPA-certified disposal facilities are located in California and Utah. These facilities will accept RCRA hazardous waste, Cal-EPA non-RCRA hazardous waste, nonhazardous waste, and inert material. Transportation of the contaminated soil to these facilities would be provided by an appropriately licensed waste-hauling company.

5.3.3.4 State and Community Acceptance

It is anticipated that Alternative 3 will receive acceptance from the state regulatory agencies and the local community. State and community concerns will be addressed following the public comment period and review of the EE/CA by the RAB, Cal-EPA, DTSC, RWQCB Santa Ana Region, and the California Integrated Waste Management Board. Limitations arising from public comments and state review were considered at that time.

5.3.4 Cost

The cost estimates for Alternative 3 were developed based on the estimated extent of soil containing copper at concentrations above the cleanup goal (Section 3.5). A project start date of August 2005 and project duration of 1 month were assumed for the cost estimate. The cost evaluation is based on estimates for capital costs and includes costs for design, construction, equipment, and mobilization. There are no annual operations and maintenance costs. Table 5-2 describes the major cost items and the estimated costs. Appendix B contains supporting cost information.

The cost estimate was performed using the RACER system developed by the U.S. Air Force. RACER cost models are based on generic engineering solutions for environmental projects, technologies, and processes. These solutions are derived from historical project information, government laboratories, construction management agencies, vendors, contractors, and engineering analysis. During implementation of this

removal alternative, cost savings may be accomplished by using clean, on-station fill materials generated during other removal/remedial actions, if available.

This cost estimate is for guidance in project evaluation and implementation. It was prepared from information available at the time of publication. The final cost of the project will depend on actual labor and material costs, actual site conditions, productivity, competitive market conditions, final project scope, final project schedule, the company selected for final project implementation, and other variable factors. As a result, the final project cost would vary from the estimates presented herein. The final project cost would also depend on the actual volume of soil removed.

6.0 COMPARATIVE ANALYSIS OF REMOVAL ACTION ALTERNATIVES

In this section, the alternatives analyzed in Section 5.0 are compared to evaluate their relative performance in relation to each of three criteria. The criteria used in this comparison are the same as those used to analyze the alternatives: effectiveness, implementability, and cost.

6.1 EFFECTIVENESS OF ALTERNATIVES

Effectiveness was evaluated based on the overall protection of human health and the environment (through assessment of long-term effectiveness and permanence, compliance with ARARs, and short-term effectiveness) and reduction of toxicity, mobility, or volume through treatment. Alternative 3, excavation with off-site disposal, is expected to be effective in meeting the RAOs because removal of copper-impacted soil above the cleanup goal would be directly observed and confirmed by soil sampling. Alternative 1, no action, would not reduce the toxicity, mobility, or volume of copper at IR Site 42. Alternative 2, partial removal and off-site disposal, would reduce the toxicity, mobility, or volume of copper but to a limited extent.

6.2 IMPLEMENTABILITY OF ALTERNATIVES

The alternatives are considered implementable. The technical feasibility is generally similar for these alternatives. Required materials and services would be available for the technologies.

Other implementability criteria, such as state and public acceptance, tend to have greater variability between the three alternatives. Alternative 3, is expected to be acceptable to regulatory agencies and the general public. Alternative 2, is unlikely to be acceptable to regulatory agencies and the general public. Alternative 1, no action, would not be an acceptable alternative to the DON, regulatory agencies, or the public.

6.3 COST

Table 6-1 summarizes the total estimated costs to implement each alternative and includes capital costs and indirect costs. These costs are shown as net present value. Under Alternative 2 and 3, there are no long-term operation and maintenance (O&M) costs. Alternative 1, of course, has the lowest cost because no action to reduce the exposure of ecological receptors to copper-impacted soil would be implemented. However, as noted previously, this alternative does not comply with all RAOs for this project.

7.0 RECOMMENDED REMOVAL ACTION ALTERNATIVE

This EE/CA was performed in accordance with current EPA and DON guidance documents for a non-time-critical removal action under CERCLA. The purpose of this EE/CA was to identify and analyze removal action alternatives to reduce the risk to ecological receptors from copper-impacted soil at IR Site 42. Because most of the potential technologies and process options were screened out, only three alternatives were identified and evaluated. Alternative 1 (no action), Alternative 2 (partial excavation with off-site disposal) and Alternative 3 (excavation with off-site disposal).

Based on comparative analyses of the removal action alternatives discussed in Section 6.0, the recommended removal action is Alternative 3. Alternative 3 involves complete removal of soil containing copper concentrations above the cleanup goal. Confirmation soil samples would be collected to verify that all soil with reported copper concentrations above the cleanup goal had been removed. Excavated soil would be transported to a permitted landfill for disposal. The site would be backfilled with clean soil, either imported or from another on-station location. A project work plan will be prepared by the RAC contractor that will take into consideration safety and health requirements and standard operating procedures.

Alternative 3 is recommended because it greatly reduces risks to ecological receptors by completely removing soil with copper concentrations above the cleanup goal. This alternative meets the RAOs, complies with ARARs and other guidance, is technically and administratively feasible, and the materials to implement this alternative are commercially available. The cost for this alternative is comparable to similar removal actions previously conducted at this facility, and under this alternative there would be no unforeseen future costs. This alternative is expected to be acceptable to the state and community. Because the recommended removal action will cost less than $1 million, an action memorandum/removal action work plan will be prepared to document the final decision.

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TABLES

Table 2-1
Summary Statistics for Analytes Reported in Soil Samples Collected During the FSI Phase II

Analyte	Frequency of Detections	Maximum Concentration	Mean Concentration	Maximum MDL	Mean MDL
VOCs (mg/kg)					
1,1,1-Trichloroethane	1 of 10	2 J	5.9	17	11
1,1,2,2-Tetrachloroethane	0 of 10	—[a]	6.4	17	11
1,1,2-Trichloroethane	0 of 10	—[a]	6.4	17	11
1,1-Dichloroethane	0 of 10	—[a]	6.4	17	11
1,1-Dichloroethene	0 of 10	—[a]	6.4	17	11
1,2,4-Trichlorobenzene	0 of 10	—[a]	6.4	17	11
1,2-Dibromo-3-chloropropane	0 of 10	—[a]	6.4	17	11
1,2-Bromomethane	0 of 10	—[a]	6.4	17	11
1,2-Dichlorobenzene	0 of 10	—[a]	6.4	17	11
1,2-Dichloroethane	0 of 10	—[a]	6.4	17	11
1,2-Dichloropropane	0 of 10	—[a]	6.4	17	11
1,3-Dichlorobenzene	0 of 10	—[a]	6.4	17	11
1,4- Dichlorobenzene	0 of 10	—[a]	6.4	17	11
2-Butanone	0 of 10	—[a]	6.4	17	11
2-Hexanone	0 of 10	—[a]	6.4	17	11
4-Methyl-2-pentanone	0 of 10	—[a]	6.4	17	11
Acetone	0 of 10	—[a]	6.4	17	11
Benzene	0 of 10	—[a]	6.4	17	11
Bromodichloromethane	0 of 10	—[a]	6.4	17	11
Bromoform	0 of 10	—[a]	6.4	17	11
Bromomethane	0 of 10	—[a]	6.4	17	11
Carbon disulfide	0 of 10	—[a]	6.4	17	11
Carbon tetrachloride	0 of 10	—[a]	6.4	17	11
Chlorobenzene	0 of 10	—[a]	6.4	17	11

Table 2-1 (contd.)
Summary Statistics for Analytes Reported in Soil Samples Collected During the FSI Phase II

Analyte	Frequency of Detections	Maximum Concentration	Mean Concentration	Maximum MDL	Mean MDL
Chlorodibromomethane	0 of 10	—[a]	6.4	17	11
Chloroethane	0 of 10	—[a]	6.4	17	11
Chloroform	0 of 10	—[a]	6.4	17	11
Chloromethane	0 of 10	—[a]	6.4	17	11
cis-1,2-Dichloroethylene	0 of 10	—[a]	6.4	17	11
cis-1,3-Dichloropropene	0 of 10	—[a]	6.4	17	11
Ethylbenzene	0 of 10	—[a]	6.4	17	11
Methylene chloride	0 of 10	—[a]	6.4	17	11
o-Xylene	0 of 10	—[a]	6.4	17	11
p-Xylene	1 of 10	1 J	5.9	17	11
Styrene	0 of 10	—[a]	6.4	17	11
Tetrachloroethene	0 of 10	—[a]	6.4	17	11
Toluene	1 of 10	1 J	5.9	17	11
trans-1,2-Dichloroethene	0 of 10	—[a]	6.4	17	11
trans-1,3-Dichloropropene	0 of 10	—[a]	6.4	17	11
Trichloroethene	0 of 10	—[a]	6.4	17	11
Vinyl chloride	0 of 10	—[a]	6.4	17	11
PAH (µg/kg)					
Acenaphthene	0 of 10	—[a]	588	4100	95
Acenaphthylene	3 of 10	100 N	1,149	8,100	190
Anthracene	0 of 10	—[a]	59	410	9.5
Benzo(a)anthracene	0 of 10	—[a]	59	410	9.5

Table 2-1 (contd.)
Summary Statistics for Analytes Reported in Soil Samples Collected During the FSI Phase II

Analyte	Frequency of Detections	Maximum Concentration	Mean Concentration	Maximum MDL	Mean MDL
Benzo(a)pyrene	3 of 10	420	81	410	9.5
Benzo(b)fluoranthene	3 of 10	530 J	132	840	20
Benzo(ghi)perylene	2 of 10	1400	221	840	20
Benzo(k)fluoranthene	3 of 10	400 J	80	410	9.5
Chrysene	3 of 10	580	98	410	9.5
Dibenzo(a,h)anthracene	0 of 10	—[a]	120	840	20
Fluoranthene	3 of 10	1800	263	840	20
Fluorene	0 of 10	—[a]	120	840	20
Indeno(1,2,3-c,d)pyrene	3 of 10	860	127	410	9.5
Naphthalene	0 of 10	—[a]	588	4100	95
Phenanthrene	3 of 10	800	120	410	9.5
Pyrene	3 of 10	1000	139	410	9.5
Metals (Total) (mg/kg)					
Aluminum	10 of 10	21,900	12,936	66	46
Antimony	0 of 10	—[a]	6.2	20	14
Arsenic	5 of 10	18	4.9	3.3	2.3
Barium	10 of 10	183	93	66	46
Beryllium	6 of 10	0.83 B	0.47	1.7	1.1
Cadmium	4 of 10	12	1.9	1.7	1.1
Calcium	10 of 10	8,280	4,917	1,650	1,150
Chromium	10 of 10	146	44	3.3	2.3
Cobalt	10 of 10	18	8.8	17	12
Copper	10 of 10	172 N	83	8.3	5.7
Iron	10 of 10	33,500	19,690	33	23

Table 2-1 (contd.)
Summary Statistics for Analytes Reported in Soil Samples Collected During the FSI Phase II

Analyte	Frequency of Detections	Maximum Concentration	Mean Concentration	Maximum MDL	Mean MDL
Lead	10 of 10	687	141	0.99	0.69
Magnesium	10 of 10	10,800	7,270	1,650	1,150
Manganese	10 of 10	509	357	5.0	3.4
Mercury	9 of 10	1.3	0.30	0.14	0.10
Molybdenum	0 of 10	—[a]	2.5	6.6	4.6
Nickel	10 of 10	58	19	13	9.2
Potassium	10 of 10	5,640	4,082	1,650	1,150
Selenium	0 of 10	—[a]	0.38	1.7	1.1
Silver	0 of 10	—[a]	1.1	3.3	2.3
Sodium	10 of 10	3,570	1,756	1,650	1,150
Thallium	0 of 10	—[a]	0.64	3.3	2.3
Vanadium	10 of 10	71	40	17	12
Zinc	10 of 10	1000 N	258	6.6	4.6

Source:
CH2M Hill 2002

Notes:
[a] dash indicates not applicable
[b] when the analytes were not detected, the arithmetic means were calculated by assuming that the analyte was detected at half the MDL

Acronyms/Abbreviations:
CRDL – contract required detection limit
CRQL – contract required quantitation limit
IDL – instrument detection limit
IR – Installation Restoration (Program)
MDL – method detection limit
µg/kg – micrograms per kilogram
mg/kg – milligrams per kilogram
SVOC – semivolatile organic compound

Data Qualifiers:
* – duplicate analysis not within control limits

Table 2-1 (contd.)
Summary Statistics for Analytes Reported in Soil Samples Collected During the FSI Phase II

B – estimated – below CRDL and above IDL
J – estimated – below CRQL and above MDL
D – quantitative value from diluted analysis – utilize undiluted analysis to evaluate data usability
N – spiked sample recovery not with in control limits

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Table 2-2
Summary Statistics for Analytes Reported in Groundwater Samples Collected During the FSI Phase II

Analyte	Frequency of Detections	Maximum Concentration	Mean Concentration	Maximum MDL	Mean MDL
VOCs (µg/L)					
1,1,1-Trichloroethane	1 of 3	3.0 J	4.3	10	10
1,1,2,2-Tetrachloroethane	0 of 3	—[a]	5	10	10
1,1,2-Trichloroethane	0 of 3	—[a]	5	10	10
1,1-Dichloroethane	1 of 3	15	8.3	10	10
1,1-Dichloroethene	1 of 3	26	12	10	10
1,2,4-Trichlorobenzene	0 of 3	—[a]	5	10	10
1,2-Dibromo-3-chloropropane	0 of 3	—[a]	5	10	10
1,2-Bromomethane	0 of 3	—[a]	5	10	10
1,2-Dichlorobenzene	0 of 3	—[a]	5	10	10
1,2-Dichloroethane	0 of 3	—[a]	5	10	10
1,2-Dichloropropane	0 of 3	—[a]	5	10	10
1,3-Dichlorobenzene	0 of 3	—[a]	5	10	10
1,4- Dichlorobenzene	0 of 3	—[a]	5	10	10
2-Butanone	0 of 3	—[a]	5	10	10
2-Hexanone	0 of 3	—[a]	5	10	10
4-Methyl-2-pentanone	0 of 3	—[a]	5	10	10
Acetone	1 of 3	13	7.7	10	10
Benzene	0 of 3	—[a]	5	10	10
Bromodichloromethane	0 of 3	—[a]	5	10	10
Bromoform	0 of 3	—[a]	5	10	10
Bromomethane	0 of 3	—[a]	5	10	10
Carbon disulfide	0 of 3	—[a]	5	10	10
Carbon tetrachloride	0 of 3	—[a]	5	10	10
Chlorobenzene	0 of 3	—[a]	5	10	10

Table 2-2 (contd.)
Summary Statistics for Analytes Reported in Groundwater Samples Collected During the FSI Phase II

Chlorodibromomethane	0 of 3	—[a]	5	10	10
Chloroethane	0 of 3	—[a]	5	10	10
Chloroform	0 of 3	—[a]	5	10	10
Chloromethane	0 of 3	—[a]	5	10	10
cis-1,2-Dichloroethylene	0 of 3	—[a]	5	10	10
cis-1,3-Dichloropropene	0 of 3	—[a]	5	10	10
Ethylbenzene	0 of 3	—[a]	5	10	10
Methylene Chloride	1 of 3	1.0 J	3.7	10	10
o-Xylene	0 of 3	—[a]	5	10	10
p-Xylene	0 of 3	—[a]	5	10	10
Styrene	0 of 3	—[a]	5	10	10
Tetrachloroethene	0 of 3	—[a]	5	10	10
Toluene	0 of 3	—[a]	5	10	10
trans-1,2-Dichloroethene	0 of 3	—[a]	5	10	10
trans-1,3-Dichloropropene	0 of 3	—[a]	5	10	10
Trichloroethene	0 of 3	—[a]	5	10	10
Vinyl chloride	0 of 3	—[a]	5	10	10
SVOCs (µg/L)					
1,2,4-trichlorobenzene	0 of 3	—[a]	5	10	10
1,2-dichlorobenzene	0 of 3	—[a]	5	10	10
1,3-dichlorobenzene	0 of 3	—[a]	5	10	10
1,4-dichlorobenzene	0 of 3	—[a]	5	10	10
2,4,5-trichlorophenol	0 of 3	—[a]	5	10	10
2,4,6-trichlorophenol	0 of 3	—[a]	5	10	10
2,4-dichlorophenol	0 of 3	—[a]	5	10	10
2,4-dimethylphenol	0 of 3	—[a]	5	10	10

Table 2-2 (contd.)
Summary Statistics for Analytes Reported in Groundwater Samples Collected During the FSI Phase II

Analyte	Frequency of Detections	Maximum Concentration	Mean Concentration	Maximum MDL	Mean MDL
2,4-dinitrophenol	0 of 3	—[a]	5	10	10
2,4-dinitrotoluene	0 of 3	—[a]	5	10	10
2,6-dinitrotoluene	0 of 3	—[a]	5	10	10
2-chloronaphthalene	0 of 3	—[a]	5	10	10
2-chlorophenol	0 of 3	—[a]	5	10	10
2-methylnaphthalene	0 of 3	—[a]	5	10	10
2-methylphenol	0 of 3	—[a]	5	10	10
2-nitroaniline	0 of 3	—[a]	13	25	25
2-nitrophenol	0 of 3	—[a]	5	10	10
3,3′-dichlorobenzidine	0 of 3	—[a]	5	10	10
3-nitroaniline	0 of 3	—[a]	13	25	25
4,6-dinitro-2-methylphenol	0 of 3	—[a]	13	25	25
4-bromophenyl phenyl ether	0 of 3	—[a]	5	10	10
4-chloro-3-methylphenol	0 of 3	—[a]	5	10	10
4-chloroaniline	0 of 3	—[a]	5	10	10
4-chlorophenyl phenyl ether	0 of 3	—[a]	5	10	10
4-methylphenol	0 of 3	—[a]			
4-nitroaniline	0 of 3	—[a]	13	25	25
4-nitrophenol	0 of 3	—[a]	13	25	25
Acenaphthene	0 of 3	—[a]	5	10	10
Acenaphthylene	0 of 3	—[a]	5	10	10

Table 2-2 (contd.)
Summary Statistics for Analytes Reported in Groundwater Samples Collected During the FSI Phase II

Analyte	Frequency of Detections	Maximum Concentration	Mean Concentration	Maximum MDL	Mean MDL
Anthracene	0 of 3	—[a]	5	10	10
Benzo(a)anthracene	0 of 3	—[a]	5	10	10
Benzo(a)pyrene	0 of 3	—[a]	5	10	10
Benzo(b)fluoranthene	0 of 3	—[a]	5	10	10
Benzo(g,h,i)perylene	0 of 3	—[a]	5	10	10
Benzo(k)fluoranthene	0 of 3	—[a]	5	10	10
Benzyl butyl phthalate	0 of 3	—[a]	5	10	10
bis(2-chloroethoxy)methane	0 of 3	—[a]	5	10	10
bis(2-chloroethyl)ether	0 of 3	—[a]	5	10	10
bis(2-chloroisopropyl)ether	0 of 3	—[a]	5	10	10
bis(2-ethylhexyl)phthalate	2 of 3	7.0 J	4.3	10	10
Carbazole	0 of 3	—[a]	5	10	10
Chrysene	0 of 3	—[a]	5	10	10
Dibenzo(a,h)anthracene	0 of 3	—[a]	5	10	10
Dibenzofuran	0 of 3	—[a]	5	10	10
Diethyl phthalate	0 of 3	—[a]	5	10	10
di-n-butyl phthalate	0 of 3	—[a]	5	10	10
di-n-octyl phthalate	0 of 3	—[a]	5	10	10
Fluoranthene	0 of 3	—[a]	5	10	10
Fluorene	0 of 3	—[a]	5	10	10
Hexachlorobenzene	0 of 3	—[a]	5	10	10
Hexachlorobutadiene	0 of 3	—[a]	5	10	10

Table 2-2 (contd.)
Summary Statistics for Analytes Reported in Groundwater Samples Collected During the FSI Phase II

Analyte	Frequency of Detections	Maximum Concentration	Mean Concentration	Maximum MDL	Mean MDL
Hexachlorocyclopentadiene	0 of 3	—[a]	5	10	10
Hexachloroethane	0 of 3	—[a]	5	10	10
Indeno(1,2,3-c,d)pyrene	0 of 3	—[a]	5	10	10
Isophorone	0 of 3	—[a]	5	10	10
Naphthalene	0 of 3	—[a]	5	10	10
Nitrobenzene	0 of 3	—[a]	5	10	10
N-nitrosodiphenylamine	0 of 3	—[a]	5	10	10
N-nitrosodipropylamine	0 of 3	—[a]	5	10	10
Pentachlorophenol	0 of 3	—[a]	5	10	10
Phenanthrene	0 of 3	—[a]	13	25	25
Phenol	0 of 3	—[a]	5	10	10
Pyrene	0 of 3	—[a]	5	10	10
Physical Parameters (mg/L)					
Total Suspended Solids	2 of 3	2,508	1,200	5.0	5.0
Metals (Total) (µg/L)					
Aluminum	3 of 3	48,900	24,125	200	200
Antimony	1 of 3	2.9 J	2.6	5.0	5.0
Arsenic	3 of 3	15	11	10	10
Barium	3 of 3	355	209	200	200
Beryllium	0 of 3	—[a]	1	5	5
Cadmium	0 of 3	—[a]	2	5	5
Calcium	3 of 3	122,000	65,050	5,000	5,000
Chromium	2 of 3	47	24	10	10
Cobalt	2 of 3	21 B	12	50	50

Table 2-2 (contd.)
Summary Statistics for Analytes Reported in Groundwater Samples Collected During the FSI Phase II

Analyte	Frequency of Detections	Maximum Concentration	Mean Concentration	Maximum MDL	Mean MDL
Copper	2 of 3	38	22	25	25
Iron	3 of 3	53,000	25,983	100	100
Lead	2 of 3	10	5.2	3.0	3.0
Magnesium	3 of 3	112,000	57,833	5,000	5,000
Manganese	3 of 3	3,300	1,741	15	15
Mercury	0 of 3	—[a]	0.015	0.2	0.2
Nickel	3 of 3	50	34	40	40
Potassium	3 of 3	25,900	14,543	5,000	5,000
Selenium	0 of 3	—[a]	1.7	5	5
Silver	0 of 3	—[a]	4.5	10	10
Sodium	3 of 3	832,000	563,667	5,000	5,000
Thallium	0 of 3	—[a]	3.3	10	10
Vanadium	2 of 3	133	71	50	50
Zinc	3 of 3	141	79	20	20
Metals (Dissolved) (µg/L)					
Aluminum	2 of 3	612	290	200	200
Antimony	0 of 3	—[a]	1.9	5	5
Arsenic	2 of 3	9.7	5.1	10	10
Barium	3 of 3	78	70	200	200
Beryllium	0 of 3	—[a]	1	5	5
Cadmium	0 of 3	—[a]	2	5	5
Calcium	3 of 3	123,000	59,350	5,000	5,000
Chromium	0 of 3	—[a]	4	10	10
Cobalt	0 of 3	—[a]	5	50	50

Table 2-2 (contd.)
Summary Statistics for Analytes Reported in Groundwater Samples Collected During the FSI Phase II

Analyte	Frequency of Detections	Maximum Concentration	Mean Concentration	Maximum MDL	Mean MDL
Copper	0 of 3	—[a]	3.5	25	25
Iron	3 of 3	893	475	100	100
Lead	0 of 3	—[a]	.5	3	3
Magnesium	3 of 3	112,000	49,583	5,000	5,000
Manganese	3 of 3	3,310	1,346	15	15
Mercury	0 of 3	—[a]	0.02	0.2	0.2
Nickel	1 of 3	17	8.3	40	40
Potassium	2 of 3	26,600	11,173	5,000	5,000
Selenium	0 of 3	—[a]	1.5	5	5
Silver	0 of 3	—[a]	4.5	10	10
Sodium	3 of 3	776,500	541,833	5,000	5,000
Thallium	0 of 3	—[a]	2.6	10	10
Vanadium	2 of 3	33 B	21	50	50
Zinc	1 of 3	11 B	6.5	20	20

Source:
CH2M Hill 2002

Notes:
[a] dash indicates not applicable
[b] when the analytes were not detected, the arithmetic means were calculated by assuming that the analyte was detected at half the MDL

Acronyms/Abbreviations:
CRDL – contract required detection limit
CRQL – contract required quantitation limit
IDL – instrument detection limit
IR – Installation Restoration (Program)
MDL – method detection limit
µg/kg – micrograms per kilogram
mg/kg – milligrams per kilogram

Table 2-2 (contd.)
Summary Statistics for Analytes Reported in Groundwater Samples Collected During the FSI Phase II

SVOC – semivolatile organic compound

Data Qualifiers:
* – duplicate analysis not within control limits
B – estimated – below CRDL and above IDL
J – estimated – below CRQL and above MDL
D – quantitative value from diluted analysis – utilize undiluted analysis to evaluate data usability

Table 4-1
General Response Actions, Technologies, and Process Options Compared to Screening Criteria

General Response Action	Technology	Process Option	Description	Effectiveness	Implementability	Cost	Retained
No action	No action	None	This process option serves as a baseline against which other process options are compared.	Risk is not reduced Does not restrict access to site Does not reduce toxicity, mobility, or volume of contaminated material Both short- and long-term effectiveness low	Feasible as it requires no action No action may not be acceptable to the state and public	No associated costs	Yes (although low in effectiveness and not expected to be acceptable to the state and public, retained for development of no action alternative for comparison purposes only)
Treatment	Physical/chemical treatment	Electrokinetic remediation	*In situ* process in which an electrical field is created in soil matrix by applying a low-intensity direct current to cause metals to migrate toward a collection area. The soil with concentrated metals in the collection area is then removed.	Ineffective due to the shallow nature of contaminants and low moisture in surface soils Metal contaminants may not be in ionic form	Implementation effort would be large in proportion to the low volume of contamination Extensive testing is required	Cost would be high	No
		Solidification/ stabilization	During solidification, contaminants are physically bound or enclosed within a stabilized mass. During stabilization, chemical reactions are induced between the stabilizing agent and contaminants to reduce their mobility.	Not totally effective at preventing contact with contaminants by ecological receptors, particularly if the result is loamy Would increase the volume of contaminated soil and raise the grade, which would be undesirable aesthetically Land use would be restricted Risk from off-site transportation is minimized or eliminated	Implementation is feasible; treatability studies are generally required Solidified material may hinder future site use Some processes result in a significant increase in volume, up to double the original volume	Costs would be fairly high	No
	Biological Treatment	Phytoremediation	Describes a variety of remediation methods that use plants to remove contaminants from soil. Phyto-extraction is a process during which water-soluble metals are taken up by the plant species. The metals are stored in the plant's aerial shoots that are harvested and either smelted for potential metal recycling/recovery or disposed of as a hazardous waste.	Ineffective in short term Potentially effective long-term, but the harvesting of plants will still periodically disturb site surface soils Requires additional human activity at the site that may interfere with ecological receptors	Long implementation process	Cost would be high Cost for personnel to monitor plants Capital costs for plants Costs for disposal of plants at end of technology period	No
Excavation/ backfilling	Partial Excavation	Mechanical excavation	Involves physically removing contaminated soil in the "hotspots" with copper concentrations above the cleanup goal using mechanical equipment.	Effective but some residual copper contaminated soil may be left in-place at the site Effective in long term but potential risk to ecological receptors may remain Potential migration of residual contaminants	Implementation is feasible and project duration is short	Cost is fairly high	Yes

(table continues)

Table 4-1 (continued)

General Response Action	Technology	Process Option	Description	Effectiveness	Implementability	Cost	Retained
	Excavation	Mechanical excavation	Involves physically removing contaminated soil with lead concentrations above the cleanup goal using mechanical equipment.	Effective because all contamination above the cleanup goal is removed from the site Short-term exposures Effective in long term	Implementation is feasible and project duration is short	Cost is high	Yes
	Backfilling	Backfilling	Backfill is applied after excavation to restore and regrade the site.	Once contaminants have been removed, the excavation is backfilled and graded to minimize injury to humans and impacts to aesthetics No future land-use restrictions	Implementation is feasible If available and of suitable quality, soil from other on-station projects will be used to backfill the excavation Clean soil may need to be imported to the site	Cost are low to medium Cost associated with backfilling are related to transportation and labor associated with obtaining the clean soil	Yes
		Revegetation	Sod is added to the site over the backfill to restore the area with grass.	Once the area has been backfilled, sod will be added to effectively restore the site to its original condition	Implementation is feasible	Cost are relatively low	Yes
Disposal	On-site disposal	On-site beneficial reuse	After soil is excavated, stockpiled, and classified, it may be staged temporarily on-site and then relocated to other Naval Weapons Station Seal Beach project locations for beneficial reuse (i.e., foundation material for landfill cap).	Small risk from exposure to contaminated soil during handling and transporting	Implementation is feasible if the soil is suitable At this time, it is not anticipated that an appropriate use for the soil will be available	Cost is fairly low Cost associated with transportation of contaminated soil to the disposal site	No
	Off-site disposal	Off-site disposal/ recycling	After soil is excavated, stockpiled, and classified, it will be disposed of. Disposal options will be chosen according to the classification of the soil. The excavated soil would be transported to an appropriate permitted landfill.	Small risk from exposure to contaminated soil during handling and transporting Small potential for spills in community during transportation of soil	Implementation is feasible The classification of the soil removed determines where the soil needs to be disposed of and the procedures needed to be followed	Cost is medium Cost associated with transportation of contaminated soil to the disposal site Cost associated disposal fees	Yes

Table 5-1
Cost Estimate for Alternative 2, Partial Excavation with Off-Site Disposal

Description	
Direct capital costs	
Mechanical excavation (for cost estimating purposes, assume 42 bank cubic yards) and backfill (63 lcy)	$1,700
Load and transport excavated material for disposal (42 lcy)	$9,810
Profile soil sampling for disposal (one composite sample per 125 lcy = 1 sample analyzed for TCLP metals [U.S. EPA Method 1311 and U.S. EPA Method 6010B/7000 series], and STLC [Cal-EPA WET])	$740
Cleanup and Landscaping (sodding) (0.01 acre)	$350
Professional labor (project oversight)	$7,700
Site Close-out Documentation (includes storage for 7 years)	$7,150
Total direct capital costs (based on November 2004 cost database)	**$27,450**
Indirect costs (e.g., general conditions, overhead, profit and owner cost) (based on November 2004 cost database)	**$31,100**
Contingency[a]	**$8,300**
Escalation[b]	**$3,350**
TOTAL COST (start date of July 2005)	**$70,200**
NET PRESENT VALUE (November 2004 dollars)	**$66,850**

Notes:

[a] 15 percent contingency has been added to cover cost increases that may result from unforeseen conditions and changes that typically occur on removal and remediation projects

[b] escalation modifies the costs in the Remedial Action Cost Engineering and Requirements database from November 2004 to the assumed project start date of July 2005

Acronyms/Abbreviations:

Cal-EPA – California Environmental Protection Agency
lcy – loose cubic yard
STLC – soluble threshold limit concentration
TCLP – toxicity characteristic leaching procedure
U.S. EPA – United States Environmental Protection Agency
WET – (Cal-EPA) Waste Extraction Test

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Table 5-2
Cost Estimate for Alternative 3, Excavation with Off-Site Disposal

Description	
Direct capital costs	
Mechanical excavation (for cost estimating purposes, assume 82 bank cubic yards) and backfill (115 lcy)	$2,750
Load and transport excavated material for disposal (82 lcy)	$18,300
Profile soil sampling for disposal (one composite sample per 125 lcy = 1 sample analyzed for TCLP metals [U.S. EPA Method 1311 and U.S. EPA Method 6010B/7000 series], and STLC [Cal-EPA WET])	$740
Confirmation soil sampling (one sample per 10- by 10-foot area + 20 percent for QC = 17 samples analyzed for total lead (U.S. EPA Method 7000 series)	$7,100
Cleanup and Landscaping (sodding) (0.02 acre)	$690
Professional labor (project oversight)	$7,700
Site Close-out Documentation (includes storage for 7 years)	$7,150
Total direct capital costs (based on November 2004 cost database)	**$44,430**
Indirect costs (e.g., general conditions, overhead, profit and owner cost) (based on November 2004 cost database)	**$37,300**
Contingency[a]	**$11,600**
Escalation[b]	**$4,700**
TOTAL COST (start date of July 2005)	**$98,030**
NET PRESENT VALUE (November 2004 dollars)	**$93,330**

Notes:

[a] 15 percent contingency has been added to cover cost increases that may result from unforeseen conditions and changes that typically occur on removal and remediation projects

[b] escalation modifies the costs in the Remedial Action Cost Engineering and Requirements database from November 2004 to the assumed project start date of July 2005

Acronyms/Abbreviations:

Cal-EPA – California Environmental Protection Agency
lcy – loose cubic yard
STLC – soluble threshold limit concentration
TCLP – toxicity characteristic leaching procedure
U.S. EPA – United States Environmental Protection Agency
WET – (Cal-EPA) Waste Extraction Test

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Table 6-1
Total Costs of Removal Action Alternatives for IR Site 42

Alternatives	Cost
Alternative 1, no action	$0
Alternative 2, partial removal with off-site disposal	$66,850
Alternative 3, excavation with off-site disposal	$93,330

Acronym/Abbreviation:
IR – Installation Restoration (Program)

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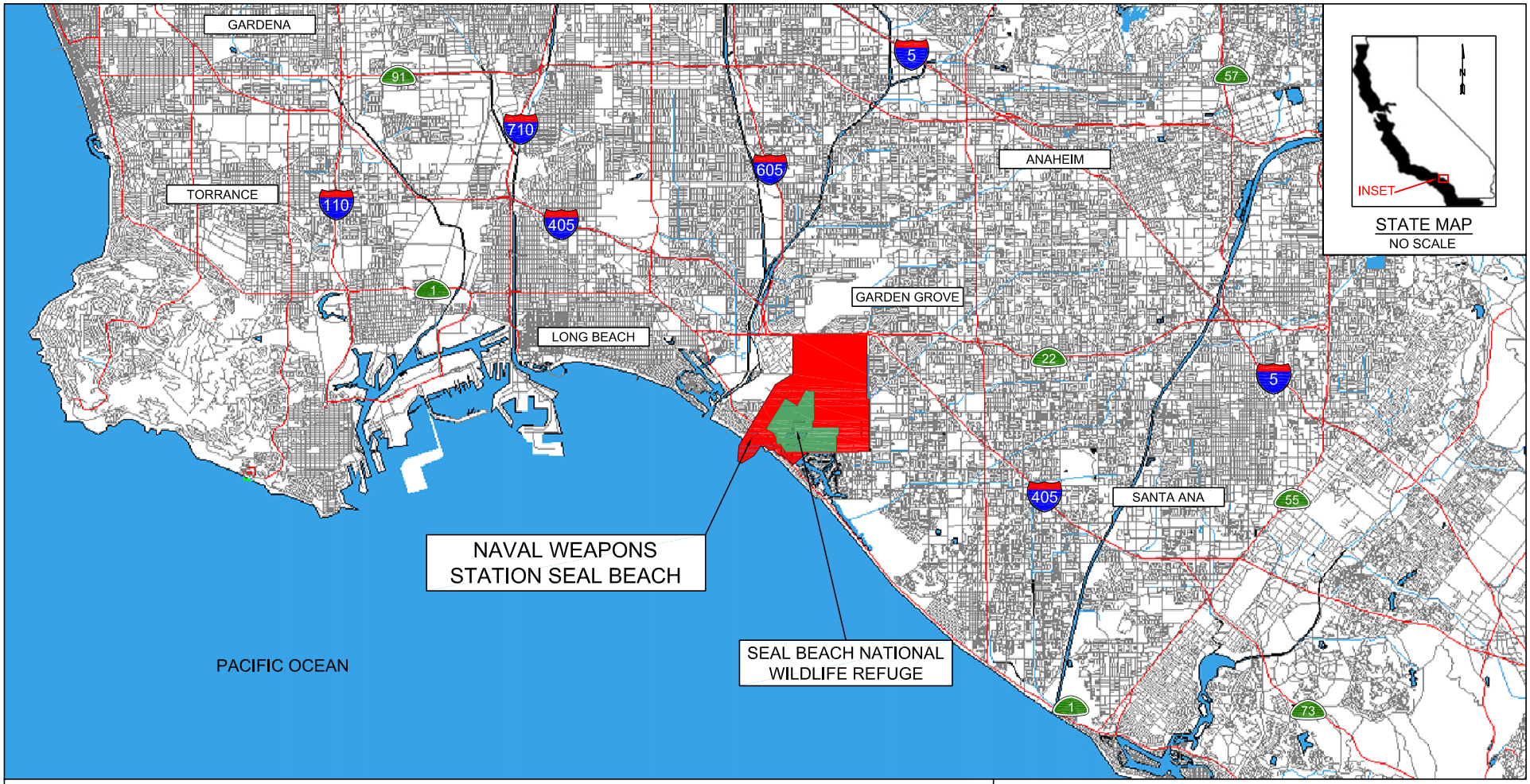
Figure 1-1

This detailed station map has been deleted from the Internet-accessible version of this document as per Department of the Navy Internet security regulations.



NAVWPNSTA SEAL BEACH
SEAL BEACH, CALIFORNIA

FIGURE 2-1
REGIONAL MAP

DEPARTMENT OF THE NAVY
SOUTHWEST DIVISION
SAN DIEGO, CALIFORNIA

NAVFAC Naval Facilities Engineering Command SOUTHWEST DIVISION

MARRS Services, Inc.

DATE: DECEMBER 2005
PROJECT NO.: CA99 064 WO24
CONTRACT NO.: N68711-99-D-6620
DELIVERY ORDER: DO24

NAVWPNSTA_SEAL BEACH_EE/CA REGIONAL MAP FIG 2-1 21DEC05.DWG

Figures 2-2 and 2-3

These detailed station maps have been deleted from the Internet-accessible version of this document as per Department of the Navy Internet security regulations.

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TABLES

ATTACHMENTS

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ACRONYMS/ABBREVIATIONS

ACL	alternative concentration limit
AM	action memorandum
AOC	area of concern
APCD	Air Pollution Control District
app.	appendix
AQMD	Air Quality Management District
AR	Administrative Record
ARAR	applicable or relevant and appropriate requirement
BAAQMD	Bay Area Air Quality Management District
BAT	best available technology
BCPCT	best conventional pollution control technology
BMP	best management practice
CAA	Clean Air Act
Cal. Civ. Code	*California Civil Code*
Cal. Code Regs.	*California Code of Regulations*
Cal/EPA	California Environmental Protection Agency
Cal. Fish & Game Code	*California Fish and Game Code*
Cal. Gov't Code	*California Government Code*
Cal. Health & Safety Code	*California Health and Safety Code*
Cal. Pub. Res. Code	*California Public Resources Code*
Cal. Water Code	*California Water Code*
CAMU	corrective action management unit
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R.	*Code of Federal Regulations*
ch.	chapter
cm	centimeter
CMECC	California Military Environmental Coordination Committee
COPC	chemical of potential concern
CTT	closed, transferred, and transferring
CWA	Clean Water Act
CWC	*California Water Code*
DERP	Defense Environmental Restoration Program
DNAPL	dense nonaqueous-phase liquid
DoD	Department of Defense
DON	Department of the Navy
DTSC	(Cal/EPA) Department of Toxic Substances Control
EE/CA	Engineering Evaluation/Cost Analysis
EIS	environmental impact statement

ACRONYMS/ABBREVIATIONS (CONT.)

ESA	Endangered Species Act
ESRP	explosives safety remediation plan
Exec. Order No.	executive order number
Fed. Reg.	*Federal Register*
FFA	Federal Facilities Agreement
FML	flexible membrane liner
FR	*Federal Register*
FS	feasibility study
g	gram
gpd	gallons per day
HDPE	high-density polyethylene
HSWA	Hazardous and Solid Waste Amendments
HWCA	Hazardous Waste Control Act
IR	Installation Restoration (Program)
LDR	land disposal restriction
LPC	liquid-phase carbon
LUFT	leaking underground fuel tank
µg/L	micrograms per liter
MCL	maximum contaminant level
MCLG	maximum contaminant level goal
mg/L	milligrams per liter
MILCON	military construction
mm	millimeter
MNA	monitored natural attenuation
MOJAQMD	Mojave Desert Air Quality Management District
MOU	memorandum of understanding
MTR	minimum technology requirement
NAAQS	National Ambient Air Quality Standards
NAWQC	National Ambient Water Quality Criteria
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollution Discharge Elimination System
NTR	National Toxics Rule
NWR	National Wildlife Refuge
OEW	ordnance or explosive waste
OSWER	Office of Solid Waste and Emergency Response
OU	operable unit

PA	preliminary assessment
PCB	polychlorinated biphenyl
ppm	parts per million
ppm_w	parts per million by weight
Pub. L.	Public Law
RA	remedial action
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RD	remedial design
Res.	Resolution
RI	remedial investigation
R3M	Range Rule Risk Methodology
ROD	record of decision
RTC	response to comments
RWQCB	(California) Regional Water Quality Control Board
SAL	state action level
SARA	Superfund Amendments and Reauthorization Act
SCAQMD	South Coast Air Quality Management District
SDAPCD	San Diego Air Pollution Control District
SDWA	Safe Drinking Water Act
SIP	State Implementation Plan
SMCL	secondary maximum contaminant level
STLC	soluble threshold limit concentration
SWAT	Solid Waste Assessment Test
SWDIV	Southwest Division Naval Facilities Engineering Command
SWRCB	(California) State Water Resource Control Board
T-BACT	best available control technology for toxics
TBC	to be considered
TCE	trichloroethene
TCLP	toxicity characteristic leaching procedure
TDS	total dissolved solids
tit.	title
TNT	trinitrotoluene
TPH	total petroleum hydrocarbons
TSCA	Toxic Substances Control Act
TSD	treatment, storage, and disposal
TTLC	total threshold limit concentration
UIC	underground injection control
U.S.C.	*United States Code*
USDW	underground source of drinking water
U.S. EPA	United States Environmental Protection Agency

USFWS	United States Fish and Wildlife Service
UST	underground storage tank
UTS	Universal Treatment Standards
UXO	unexploded ordnance
VGAC	vapor-phase granular activated carbon
VOC	volatile organic compound
WPNSTA	Naval Weapons Station
WQCP	Water Quality Control Plan
WQO	water quality objective
WSRA	Wild and Scenic Rivers Act

A1.0 INTRODUCTION

This appendix identifies and evaluates potential federal and state of California applicable or relevant and appropriate requirements (ARARs) from the universe of regulations, requirements, and guidance and sets forth the Department of the Navy (DON) determinations regarding those potential ARARs for each removal action alternative retained for detailed analysis in this engineering evaluation/cost analysis (EE/CA) for Installation Restoration (IR) Site 42, Naval Weapons Station Seal Beach, Seal Beach, California.

This evaluation includes an initial determination of whether the potential ARARs actually qualify as ARARs, and a comparison for stringency between the federal and state regulations to identify the controlling ARARs. The identification of ARARs is an iterative process. The final determination of ARARs will be made by the DON in the record of decision (ROD) or action memorandum (AM), after public review, as part of the removal action selection process.

A1.1 SUMMARY OF CERCLA AND NCP REQUIREMENTS

Section 121(d) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, 42 *United States Code* [U.S.C.] Section [§] 9621[d]), as amended, states that remedial actions on CERCLA sites must attain (or the decision document must justify the waiver of) any federal or more stringent state environmental standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate.

Section 121(d) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, 42 *United States Code* [U.S.C.] Section [§] 9621[d]), as amended, states that remedial actions at CERCLA sites must attain (or the decision document must justify the waiver of) any federal or more stringent state environmental standards, requirements, criteria, or limitations determined to be legally applicable or relevant and appropriate. Although Section 121 of CERCLA does not itself expressly require that CERCLA removal actions comply with ARARs, the United States Environmental Protection Agency (U.S. EPA) has promulgated a requirement in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) mandating that CERCLA removal actions ". . . shall, to the extent practicable considering the exigencies of the situation, attain applicable or relevant and appropriate requirements under

federal environmental or state environmental or facility siting laws" (Title 40 *Code of Federal Regulations* [C.F.R.] §300.415[j]) (40 C.F.R. § 300.415[j]). It is DON policy to follow this requirement. Certain specified waivers may be used for removal actions, as is the case with remedial actions.

Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address the situation at a CERCLA site. The requirement is applicable if the jurisdictional prerequisites of the standard show a direct correspondence when objectively compared to the conditions at the site. An applicable federal requirement is an ARAR. An applicable state requirement is an ARAR only if it is more stringent than federal ARARs.

If the requirement is not legally applicable, then the requirement is evaluated to determine whether it is relevant and appropriate. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable, address problems or situations similar to the circumstances of the proposed removal action and are well suited to the conditions of the site (U.S. EPA 1988a). A requirement must be determined to be both relevant and appropriate in order to be considered an ARAR.

The criteria for determining relevance and appropriateness are listed in 40 C.F.R. § 300.400(g)(2) and include the following:

- the purpose of the requirement and the purpose of the CERCLA action;
- the medium regulated or affected by the requirement and the medium contaminated or affected at the CERCLA site;
- the substances regulated by the requirement and the substances found at the CERCLA site;
- the actions or activities regulated by the requirement and the removal action contemplated at the CERCLA site;
- any variances, waivers, or exemptions of the requirement and their availability for the circumstances at the CERCLA site;

- the type of place regulated and the type of place affected by the release or CERCLA action;
- the type and size of structure or facility regulated and the type and size of structure or facility affected by the release or contemplated by the CERCLA action; and
- any consideration of use or potential use of affected resources in the requirement and the use or potential use of the affected resources at the CERCLA site.

According to CERCLA ARARs guidance (U.S. EPA 1988a), a requirement may be "applicable" or "relevant and appropriate," but not both. Identification of ARARs must be done on a site-specific basis and involve a two-part analysis: first, a determination whether a given requirement is applicable; then, if it is not applicable, a determination whether it is nevertheless both relevant and appropriate. It is important to explain that some regulations may be applicable or, if not applicable, may still be relevant and appropriate. When the analysis determines that a requirement is both relevant and appropriate, such a requirement must be complied with to the same degree as if it were applicable (U.S. EPA 1988a).

Tables included in this appendix present each potential ARAR with an initial determination of ARAR status (i.e., applicable, relevant and appropriate, or not an ARAR). For the determination of relevance and appropriateness, the pertinent criteria were examined to determine whether the requirements addressed problems or situations sufficiently similar to the circumstances of the release or removal action contemplated, and whether the requirement was well suited to the site. A negative determination of relevance and appropriateness indicates that the requirement did not meet the pertinent criteria. Negative determinations are documented in the tables of this appendix and are discussed in the text only for specific cases.

To qualify as a state ARAR under CERCLA and the NCP, a state requirement must be:

- a state law or regulation,
- an environmental or facility siting law or regulation,
- promulgated (of general applicability and legally enforceable),
- substantive (not procedural or administrative),

- more stringent than federal requirements,
- identified in a timely manner, and
- consistently applied.

To constitute an ARAR, a requirement must be substantive. Therefore, only the substantive provisions of requirements identified as ARARs in this analysis are considered to be ARARs. Permits are considered to be procedural or administrative requirements. Provisions of generally relevant federal and state statutes and regulations that were determined to be procedural or non-environmental, including permit requirements, are not considered to be ARARs. CERCLA Section 121(e)(1), 42 U.S.C. § 9621(e)(1), states that "No Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely on-site, where such remedial action is selected and carried out in compliance with this section." The term *on-site* is defined for purposes of this ARARs discussion as "the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the removal action" (40 C.F.R. § 300.5).

Non-promulgated advisories or guidance issued by federal or state governments are not legally binding and do not have the status of ARARs. Such requirements may, however, be useful, and are "to be considered" (TBC). TBC (40 C.F.R. § 300.400[g][3]) requirements complement ARARs but do not override them. They are useful for guiding decisions regarding cleanup levels or methodologies when regulatory standards are not available.

Pursuant to U.S. EPA guidance (U.S. EPA 1988a), ARARs are generally divided into three categories: chemical-specific, location-specific, and action-specific requirements. This classification was developed to aid in the identification of ARARs; some ARARs do not fall precisely into one group or another. ARARs are identified on a site basis for remedial actions where CERCLA authority is the basis for cleanup.

As the lead federal agency, the DON has primary responsibility for identifying federal ARARs at Installation Restoration (IR) Site 42, Naval Weapons Station (NAVWRNSTA) Seal Beach. Potential federal ARARs that have been identified for the IR Site 42 EE/CA are discussed in Section A1.2.2. Pursuant to the definition of the term *on-site* in 40 C.F.R. § 300.5, the on-station

areas that are part of this action are considered to be on-site. IR Site 42 has two main areas of concern: 1) the 1,500-gallon oil-water separator east of Building 236; and 2) discharges to the National Wildlife Refuge (NWR) from a storm water collection basin drainpipe. The maintenance shop oil-water separator began operation in 1978 and separates floatable oil from wastewater generated from Buildings 235 and 236. The 1,500-gallon capacity oil-water separator is currently active. The clarified wastewater discharges to a sanitary sewer pipe. Also, in the vicinity of the oil-water separator, a storm water collection basin exists, that discharges through a drainpipe to the National Wildlife Refuge (NWR). The chemicals of potential concern (COPCs) at IR Site 42 were volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polynuclear aromatic hydrocarbons (PAHs), and metals. Based on the ecological risk screening performed as part of the Focused Site Inspection (FSI) Phase II (CH2M Hill 2002), ecologically significant risks to terrestrial receptors exist from metals in soil. Copper is the primary contributor to ecological risks at the site. The removal alternatives being considered for evaluation in the IR Site 42 EE/CA are no action, partial excavation with off-site disposal, and excavation with off-site disposal. Since the impacted area at IR Site 42 is within the NWR, the removal action will be conducted "out of breeding season" and disturbance of surrounding areas within the NWR will be minimized.

Identification of potential state ARARs was initiated through DON requests that the California Environmental Protection Agency (Cal/EPA) Department of Toxic Substances Control (DTSC) identify potential state ARARs, an action described in more detail in Section A1.2.3. Potential state ARARs that have been identified for IR Site 42 are discussed below.

A1.2 METHODOLOGY DESCRIPTION

The process of identifying and evaluating potential federal and state ARARs is described in this subsection.

A1.2.1 General

As the lead federal agency, the DON has primary responsibility for identification of potential ARARs for IR Site 42. In preparing this ARARs analysis, the DON undertook the following measures, consistent with CERCLA and the NCP:

- identified federal ARARs for each removal action alternative addressed in the EE/CA, taking into account site-specific information for IR Site 42;
- reviewed potential state ARARs identified by the state to determine whether they satisfy CERCLA and NCP criteria that must be met in order to constitute state ARARs;
- evaluated and compared federal ARARs and their state counterparts to determine whether state ARARs are more stringent than the federal ARARs or are in addition to the federally required actions; and
- reached a conclusion as to which federal and state ARARs are the most stringent and/or "controlling" ARARs for each alternative.

Removal action alternatives being considered for evaluation in the IR Site 42 EE/CA are no action, partial excavation with off-site disposal, and excavation with off-site disposal. Based on the proposed cleanup goal developed during the EE/CA, the area of impacted soil subject to removal action is approximately 650 square feet. The depth of the removal area is expected to be approximately 3 feet. Therefore, the volume of impacted soil subject to a removal action is approximately 72 cubic yards.

A1.2.2 Identifying and Evaluating Federal ARARs

The DON is responsible for identifying federal ARARs as the lead federal agency under CERCLA and the NCP. The final determination of federal ARARs will be made when the DON issues the AM. The federal government implements a number of federal environmental statutes that are the source of potential federal ARARs, either in the form of the statutes or regulations promulgated there under. Examples include the Resource Conservation and Recovery Act (RCRA), the Clean Water Act, the Safe Drinking Water Act, the Toxic Substances Control Act, and their implementing regulations, to name a few. See NCP preamble at 55 *Federal Register* (Fed. Reg.) 8764–8765 (1990) for a more complete listing.

The proposed removal action and alternatives were reviewed against all potential federal ARARs, including but not limited to those set forth at 55 Fed. Reg. 8764–8765 (1990), in order to determine if they were applicable or relevant and appropriate utilizing the CERCLA and NCP criteria and procedures for ARARs identification by lead federal agencies.

A1.2.3 Identifying and Evaluating State ARARs

The process of identifying and evaluating potential state ARARs by the state and the DON is described in this subsection.

A1.2.3.1 SOLICITATION OF STATE ARARs UNDER NCP

U.S. EPA guidance (U.S. EPA 1988b) recommends that the lead federal agency consult with the state when identifying state ARARs for remedial actions. In essence, the CERCLA/NCP requirements at 40 C.F.R. § 300.515 for remedial actions provide that the lead federal agency request that the state identify chemical- and location-specific state ARARs upon completion of site characterization. The requirements also provide that the lead federal agency request identification of all categories of state ARARs (chemical-, location-, and action-specific) upon completion of identification of remedial alternatives for detailed analysis. The state must respond within 30 days of receipt of the lead federal agency requests. The remainder of this subsection documents the DON's efforts to date to identify and evaluate state ARARs.

The DON followed the procedures of the process set forth in 40 C.F.R. § 300.515 and Section 7.6 of the Federal Facilities Agreement (FFA) for remedial actions in seeking state assistance in identifying state ARARs.

A1.2.3.2 CHRONOLOGY OF EFFORTS TO IDENTIFY STATE ARARs

The following chronology summarizes the DON efforts to obtain state assistance in identifying state ARARs for the removal action at IR Site 42. Key correspondence between the DON and the state agencies relating to this effort is attached as Attachment A to this appendix and has been included in the Administrative Record (AR) for this EE/CA.

The DON formally requested state chemical-, location-, and action-specific ARARs for IR Sites 42. A letter dated August 3, 2004 was sent to the DTSC. The DON received a letter from DTSC providing a list of potential state action-, chemical- and location-specific ARARs dated October 7, 2004.

Following the DON solicitation for ARARs from DTSC, DTSC requested ARARs from other state and local agencies. DTSC issued a letter to the DON on October 7, 2004 with correspondence regarding the ARARs solicitation from the following agencies.

- California Department of Fish and Game (correspondence dated September 28, 2004)
- South Coast Air Quality Management District (correspondence dated September 23, 2004)
- California Air Resources Board (correspondence dated September 10, 2004)
- City of Seal Beach, Environmental Quality Control Board (correspondence dated September 29, 2004)

In addition, the California Regional Water Quality Control Board, Santa Ana Region issued a letter to the DON on October 12, 2004 in response to the ARARs request.

A1.3 OTHER GENERAL ISSUES

General issues identified during the evaluation of ARARs for IR Site 42 are discussed in the following subsections.

A1.3.1 General Approach to Requirements of the Federal Resource Conservation and Recovery Act

The RCRA is a federal statute passed in 1976 to meet four goals: the protection of human health and the environment, the reduction of waste, the conservation of energy and natural resources, and the elimination of the generation of hazardous waste as expeditiously as possible. The Hazardous and Solid Waste Amendments (HSWA) of 1984 significantly expanded the scope of RCRA by adding new corrective action requirements, land disposal restrictions, and technical requirements. RCRA, as amended, contains several provisions that are potential ARARs for CERCLA sites.

Substantive RCRA requirements are applicable to removal actions on CERCLA sites if the waste is a RCRA hazardous waste, and either:

- the waste was initially treated, stored, or disposed after the effective date of the particular RCRA requirement; or
- the activity at the CERCLA site constitutes treatment, storage, or disposal, as defined by RCRA (U.S. EPA 1988a).

The preamble to the NCP indicates that state regulations that are components of a federally authorized or delegated state program are generally considered federal requirements and potential federal ARARs for the purposes of ARARs analysis (55 Fed. Reg. 8666, 8742 [1990]). The state of California received approval for its base RCRA hazardous waste management program on 23 July 1992 (57 Fed. Reg. 32726 [1992]). The state of California "Environmental Health Standards for the Management of Hazardous Waste," set forth in Title 22 *California Code of Regulations*, Division 4.5 (Cal. Code Regs. tit. 22, div. 4.5), were approved by U.S. EPA as a component of the federally authorized state of California RCRA program. On 26 September 2001, California received final authorization of its revised State Hazardous Waste Management Program by the U.S. EPA (63 Fed. Reg. 49118 [2001]).

The regulations of Cal. Code Regs. tit. 22, div. 4.5 are, therefore, a source of potential federal ARARs for CERCLA removal actions. The exception is when a state regulation is "broader in scope" than the corresponding federal RCRA regulations. In that case, such regulations are not considered part of the federally authorized program or potential federal ARARs. Instead, they are purely state law requirements and potential state ARARs.

The U.S. EPA 23 July 1992 notice approving the state of California RCRA program (57 Fed. Reg. 32726 [1992]) specifically indicated that the state regulations addressed certain non-RCRA, state-regulated hazardous wastes that fell outside the scope of federal RCRA requirements. Cal. Code Regs. tit. 22, div. 4.5 requirements would be potential state ARARs for such non-RCRA, state-regulated wastes.

A key threshold question for the ARARs analysis is whether or not the contaminants at IR Site 42 constitute federal hazardous waste as defined under RCRA and the state's authorized program or qualify as non-RCRA, state-regulated hazardous waste. A discussion of waste characterization is included in Section A1.4.

A1.4 WASTE CHARACTERIZATION

Selection of ARARs involves the characterization of wastes as described below.

A1.4.1 RCRA Hazardous Waste Determination

Federal RCRA hazardous waste determination is necessary to determine whether a waste is subject to RCRA requirements at Cal. Code Regs. tit. 22, div. 4.5 and other state requirements at Cal. Code Regs. tit. 23, div. 3, Chapter (ch.) 15. The first step in the RCRA hazardous waste characterization process is to evaluate contaminated media at the site(s) and determine whether the contaminant constitutes a "listed" RCRA waste. The preamble to the NCP states that "… it is often necessary to know the origin of the waste to determine whether it is a listed waste and that, if such documentation is lacking, the lead agency may assume it is not a listed waste" (55 Fed. Reg. 8666, 8758 [1990]).

This approach is confirmed in U.S. EPA guidance for CERCLA compliance with other laws (U.S. EPA 1988a), as follows:

> "To determine whether a waste is a listed waste under RCRA, it is often necessary to know the source. However, at many Superfund sites, no information exists on the source of wastes. The lead agency should use available site information, manifests, storage records, and vouchers in an effort to ascertain the nature of these contaminants. When this documentation is not available, the lead agency may assume that the wastes are not listed RCRA hazardous wastes, unless further analysis or information becomes available that allows the lead agency to determine that the wastes are listed RCRA hazardous wastes."

RCRA hazardous wastes that have been assigned U.S. EPA hazardous waste numbers (or codes) are listed in Cal. Code Regs. tit. 22, §§ 66261.30–66261.33. The lists include hazardous waste codes beginning with the letters "F," "K," "P," and "U."

Knowledge of the exact source of a waste is required for source-specific listed wastes ("K" waste codes). Some knowledge of the nature or source of the waste is required even for listed wastes from nonspecific sources, such as spent solvents ("F" waste codes) or commercial chemical

products ("P" and "U" waste codes). These listed RCRA hazardous wastes are restricted to commercially pure chemicals used in particular processes such as degreasing.

P and U wastes cover only unused and unmixed commercial chemical products, particularly spilled or off-spec products (U.S. EPA 1991a). Not every waste containing a P or U chemical is a hazardous waste. To determine whether a CERCLA investigation-derived waste contains a P or U waste, there must be direct evidence of product use. In particular, all the following criteria must be met. The chemicals must be:

- discarded (as described in 40 CFR § 261.2[a][2]),
- either off-spec commercial products or a commercially sold grade,
- not used (soil contaminated with spilled unused wastes is a P or U waste), and
- the sole active ingredient in a formulation.

The second step in the RCRA hazardous waste characterization process is to evaluate potential hazardous characteristics of the waste. The evaluation of characteristic waste is described in U.S. EPA guidance as follows (U.S. EPA 1988a):

> Under certain circumstances, although no historical information exists about the waste, it may be possible to identify the waste as RCRA characteristic waste. This is important in the event that (1) remedial alternatives under consideration at the site involve on-site treatment, storage, or disposal, in which case RCRA may be triggered as discussed in this section; or (2) a remedial alternative involves off-site shipment. Since the generator (in this case, the agency or responsible party conducting the Superfund action) is responsible for determining whether the wastes exhibit any of these characteristics (defined in 40 C.F.R. §§ 261.21–261.24), testing may be required. The lead agency must use best professional judgment to determine, on a site-specific basis, if testing for hazardous characteristics is necessary.

In determining whether to test for the toxicity characteristic using the extraction procedures (EP) toxicity test, it may be possible to assume that certain low concentrations of waste are not toxic. For example, if the total waste concentration in soil is 20 times or less the EP toxicity concentration, the waste cannot be characteristic hazardous waste. In such a case, RCRA

requirements would not be applicable. In other instances, where it appears that the substances may be characteristic hazardous waste (ignitable, corrosive, reactive, or EP toxic), testing should be performed.

Hazardous waste characteristics, as defined in 40 C.F.R. §§ 261.21–261.24, are commonly referred to as ignitability, corrosivity, reactivity, and toxicity. California environmental health standards for the management of hazardous waste set forth in Cal. Code Regs. tit. 22, div. 4.5 were approved by U.S. EPA as a component of the federally authorized California RCRA program. Therefore, the characterization of RCRA waste is based on the state requirements.

The characteristics of ignitability, corrosivity, reactivity, and toxicity are defined in Cal. Code Regs. tit. 22, §§ 66261.21–66261.24. According to Cal. Code Regs. tit. 22, § 66261.24(a)(1)(A), "A waste that exhibits the characteristic of toxicity pursuant to subsection (a)(1) of this section has the EPA Hazardous Waste Number specified in Table I of this section which corresponds to the toxic contaminant causing it to be hazardous." Table I assigns hazardous waste codes beginning with the letter "D" to wastes that exhibit the characteristic of toxicity; D waste codes are limited to "characteristic" hazardous wastes.

According to Cal. Code Regs. tit. 22, § 66261.10, waste characteristics can be measured by an available standardized test method or be reasonably classified by generators of waste based on their knowledge of the waste provided that the waste has already been reliably tested or if there is documentation of chemicals used. Based on knowledge of the metal contamination in the soil, there is the potential that once excavated it could be classified as a hazardous waste.

Soil contamination at IR Site 42 is not ignitable, corrosive, or reactive, as defined in Cal. Code Regs. tit. 22, § 66261.21–66261.23. This determination was based on knowledge of the nature and concentrations of contaminants.

The requirements at Cal. Code Regs. tit. 22, § 66261.24 list the toxic contaminant concentrations that determine the characteristic of toxicity. The concentration limits are in milligrams per liter (mg/L). These units are directly comparable to total concentrations in waste groundwater and

surface water. For waste soils, these concentrations apply to the extract or leachate produced by the toxicity characteristic leaching procedure (TCLP).

A waste is considered hazardous if the contaminants in the wastewater or in the soil TCLP extract equal or exceed the TCLP limits. TCLP testing is required only if total contaminant concentrations in soil equal or exceed 20 times the TCLP limits because TCLP uses a 20-to-1 dilution for the extract (U.S. EPA 1988a). Due to the a total concentration of lead (687 mg/kg) in one soil sample at the site is greater than 20 times the TCLP limit for lead of 5 mg/L, all of the soil subject to removal is considered to be a potential RCRA hazardous waste and would require TCLP testing to make the final classification for off-site disposal. TCLP testing would be performed for metals. During on-site activities, the soil will be treated as RCRA hazardous.

A1.4.2 California-Regulated, Non-RCRA Hazardous Waste

A waste determined not to be a RCRA hazardous waste may still be considered a state-regulated non-RCRA hazardous waste. The state is broader in scope in its RCRA program in determining hazardous waste. Cal. Code Regs. tit. 22, § 66261.24(a)(2) lists the total threshold limit concentrations (TTLCs) and the soluble threshold limit concentrations (STLCs) for non-RCRA hazardous waste. The state applies its own leaching procedure, WET, which uses a different acid reagent and has a different dilution factor (tenfold). There are other state requirements that may be broader in scope than federal ARARs for identifying non-RCRA wastes regulated by the state. These may be potential ARARs for wastes not covered under federal ARARs. See additional subsections of Cal. Code Regs. tit. 22, § 66261.24. A waste is considered hazardous if its total concentrations exceed the TTLCs or if the extract concentrations from the waste extraction test (WET) exceed the STLCs.

A WET is required when the total concentrations exceed the STLC but are less than the TTLCs (Cal. Code Regs. tit. 22, div. 4.5, ch. 11, Appendix [app.] II [b]). For the removal action at IR Site 42, the soil subject to the removal action is not expected that any metal concentration will exceed their respective TTLC limit. A portion of the soil subject to the removal is expected to exceed the STLC limit of 5 mg/L for lead. This portion of the soil is considered to be a potential non-RCRA hazardous waste. The final classification would be made based on the results of the WET, which would be performed for all metals. If the waste has been determined to be similar

to a RCRA hazardous waste, it does not need to be evaluated as a non-RCRA hazardous waste. For this removal action, it may not be necessary to evaluate the soil as a non-RCRA hazardous waste for off-site disposal, because the waste may be classified as a RCRA hazardous waste as discussed in Section A1.4.1. Based on the potential for the soil subject to removal to be classified as RCRA hazardous waste, the soil will be handled as RCRA hazardous during all on-site activities. Therefore, the requirements described in this section are not potential ARARs.

A1.4.3 Other California Waste Classifications

For waste discharged after 18 July 1997, solid waste classifications at Cal. Code Regs. tit. 27, §§ 20210, 20220, and 20230 are used to determine applicability of waste management requirements. These are summarized below.

A "designated waste" under Cal. Code Regs. tit. 27, § 20210 is defined at Cal. Water Code § 13173. Under Cal. Water Code § 13173, designated waste is hazardous waste that has been granted a variance from hazardous waste management requirements or non-hazardous waste that consists of or contains pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses of the waters of the state.

A non-hazardous solid waste under Cal. Code Regs. tit. 27, § 20220 is all putrescible and non-putrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, manure, vegetable or animal solid and semisolid wastes, and other discarded waste (whether of solid or semisolid consistency), provided that such wastes do not contain wastes that must be managed as hazardous wastes or wastes that contain soluble pollutants in concentrations that exceed applicable water quality objectives or could cause degradation of waters of the state.

Under Cal. Code Regs. tit. 27, § 20230, inert waste is that subset of solid waste that does not contain hazardous waste or soluble pollutants at concentrations in excess of

applicable water quality objectives and does not contain significant quantities of decomposable waste.

The waste characterization requirements described in this section are not potential ARARs because the waste is assumed to be similar to RCRA hazardous waste and will be handled on-site under the identified RCRA ARARs.

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A2.0 CHEMICAL-SPECIFIC ARARS

Chemical-specific ARARs are generally health- or risk-based numerical values or methodologies applied to site-specific conditions that result in the establishment of a cleanup level. Many potential ARARs associated with particular response alternatives (such as closure or discharge) can be characterized as action-specific but include numerical values or methodologies to establish them so they fit in both categories (chemical- and action-specific). To simplify the comparison of numerical values, most action-specific requirements that include numerical values are included in this chemical-specific section and, if repeated in the action-specific section, the discussion refers back to this section.

This section presents ARARs determination conclusions addressing numerical values for soil and a summary of the ARARs conclusions and a more detailed discussion of the ARARs for soil.

Potential federal and state chemical-specific ARARs are summarized in Tables A2-1 and A2-2, respectively, which are at the end of this section.

A2.1 SUMMARY OF ARARs CONCLUSIONS BY MEDIUM

Soil is the environmental medium potentially affected by the IR Site 42 removal action alternatives. The conclusions for ARARs pertaining to these medium are presented in the following sections.

A2.1.1 Groundwater ARARs Conclusions

Groundwater is not included in the scope of this EE/CA. There is no indication that waste constituents have been released or that there is the potential for release to groundwater. Therefore, no groundwater ARARs were identified for this removal action. Tables A2-1 and A2-2 summarized the evaluated chemical-specific requirements for groundwater and briefly discuss their ARAR status.

A2.1.2 Surface Water ARARs Conclusions

Neither surface water discharge nor surface water cleanup is included for the potential removal action at IR Site 42. There is no indication that waste constituents have been released or that

there is the potential for release to surface water. Therefore, no potential ARARs were identified for this removal action. Tables A2-1 and A2-2 summarize the evaluated chemical-specific requirements for surface water and briefly discuss their ARAR status.

A2.1.3 Soil ARARs Conclusions

In cases of soil excavation, sufficient data must be available to evaluate whether the material could be classified as a hazardous waste. Comparing the site waste to the definition of RCRA hazardous waste can make the determination of whether a waste is a RCRA hazardous waste. The RCRA requirements at Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100 are potentially applicable ARARs because they define RCRA hazardous waste.

Under the California RCRA Program, waste can be classified as non-RCRA state-only hazardous waste if it meets specified conditions, as defined in Cal. Code Regs. tit. 22, § 66261.22(a)(3) and (4), 66261.24(a)(2)–(a)(8), 66261.101, and 66261.3(a)(2)(C) or 66261.3(a)(2)(F). These requirements have been identified as potentially applicable because a determination will be made as to whether wastes generated may be classified as non-RCRA wastes.

A2.1.4 Sediment ARARs Conclusions

There are no chemical-specific ARARs for sediment for this EE/CA. Tables A2-1 and A2-2 summarize the evaluated requirements and briefly discuss their potential ARARs status. Additional potential sediment ARARs are included in the action-specific ARARs (Section A4).

A2.1.5 Air ARARs Conclusions

There are no chemical-specific ARARs for air for this EE/CA. Tables A2-1 and A2-2 summarize the evaluated requirements and briefly discuss their potential ARARs status. Additional potential air ARARs are included in the action-specific ARARs (Section A4).

A2.2 DETAILED DISCUSSION OF ARARs BY MEDIUM

The following subsections provide a detailed discussion of federal and state ARARs by medium.

A2.2.1 Soil ARARs

The key threshold question for soil ARARs is whether or not the wastes located at the IR Site 42 would be classified as hazardous waste. The soil may be classified as a federal hazardous waste as defined by RCRA and the state-authorized program, or as non-RCRA, state-regulated hazardous waste. If the soil is determined to be hazardous waste, the appropriate requirements will apply.

A2.2.1.1 FEDERAL

RCRA Hazardous Waste and Groundwater Protection Standards

The federal RCRA requirements at 40 C.F.R. pt. 261 do not apply in California because the state RCRA program is authorized. The authorized state RCRA requirements are therefore considered potential federal ARARs (see Section A1.3.1). The applicability of RCRA requirements depends on whether the waste is a RCRA hazardous waste, whether the waste was initially treated, stored, or disposed after the effective date of the particular RCRA requirement, and whether the activity at the site constitutes treatment, storage, or disposal as defined by RCRA. However, RCRA requirements may be relevant and appropriate even if they are not applicable. Examples include activities that are similar to the definition of RCRA treatment, storage, or disposal for waste that is similar to RCRA hazardous waste.

The determination of whether a waste is a RCRA hazardous waste can be made by comparing the site waste to the definition of RCRA hazardous waste. The RCRA requirements at Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100 are potential ARARs because they define RCRA hazardous waste. A waste can meet the definition of hazardous waste if it has the toxicity characteristic of hazardous waste. This determination is made by using the toxicity characteristic leaching procedure (TCLP). The maximum concentrations allowable for the TCLP listed in § 66261.24(a)(1)(B) are potential federal

ARARs for determining whether the site has hazardous waste. If the site waste has concentrations exceeding these values, it is determined to be a characteristic RCRA hazardous waste (see Section A1.4.1).

The requirements at Cal. Code Regs. tit. 22, § 66264.94(a)(1), (a)(3), (c), (d), and (e) are potential federal ARARs for the vadose zone (i.e., the unsaturated zone contamination). These sections set concentration limits for the unsaturated zone as well as for groundwater and surface water. These requirements are considered to be potential federal ARARs because they are part of the approved state RCRA program.

RCRA land disposal restrictions (LDRs) at Cal. Code Regs. tit. 22, § 66268.1(f) are potential federal ARARs for discharging waste to land. This section prohibits the disposal of hazardous waste to land unless 1) it is treated in accordance with the treatment standards of Cal. Code Regs. tit. 22, § 66268.40 and the underlying hazardous constituents meet the Universal Treatment Standards at Cal. Code Regs. tit. 22, § 66268.48; 2) it is treated to meet the alternative soil treatment standards of Cal. Code Regs. tit. 22, § 66268.49; or a treatability variance is obtained under Cal. Code Regs. tit. 22, § 66268.44. These are potentially applicable federal ARARs because they are part of the state-approved RCRA program. RCRA Treatment Standards for non-RCRA, state-regulated waste are not potentially applicable federal ARARs but they may be relevant and appropriate state ARARs.

Military Munitions Rule

The Military Munitions Rule identifies when conventional and chemical military munitions become a hazardous waste under RCRA. It also provides for safe storage and transport of such waste. The requirements for military munitions have been consolidated into 40 C.F.R. § 266 subpt. M with appropriate references to other requirements (e.g., treatment and disposal). The substantive provisions of these requirements are potential federal ARARs for response actions that include the treatment, storage, and disposal of munitions or waste that contains munitions until such time as state regulations are approved as part of the RCRA authorization process. The substantive provisions of these requirements are potential ARARs for military munitions and need to be evaluated for site-specific ARAR status.

A2.2.1.2 STATE

RCRA Requirements

State RCRA requirements included within the U.S. EPA-authorized RCRA program for California are considered to be potential federal ARARs and are discussed above. When state regulations are either broader in scope or more stringent than their federal counterparts, they are considered potential state ARARs. State requirements such as the non-RCRA, state-regulated hazardous waste requirements may be potential state ARARs because they are not within the scope of the federal ARARs (57 Fed. Reg. 60848). The Cal. Code Regs. tit. 22, div. 4.5 requirements that are part of the state-approved RCRA program would be potential state ARARs for non-RCRA, state-regulated hazardous wastes.

The site waste characteristics need to be compared to the definition of non-RCRA, state-regulated hazardous waste. The non-RCRA, state-regulated waste definition requirements at Cal. Code Regs. tit. 22, § 66261.24(a)(2) are potential state ARARs for determining whether other RCRA requirements are potential state ARARs. This section lists the total threshold limit concentrations (TTLCs) and soluble threshold limit concentration (STLCs). The site waste may be compared to these thresholds to determine whether it meets the characteristics for a non-RCRA, state-regulated hazardous waste. However, based on the evaluation in Section A1.4.1, the soil subject to removal will be treated as potential RCRA hazardous waste and, as a result, the state RCRA requirements are not applicable for on-site activities.

SWRCB Res. 92-49

Cal. Code Regs. tit. 23, div. 3, ch. 15

The requirements at this section define a hazardous waste that is covered by the Chapter 15 requirements. These are not more stringent than federal or state RCRA ARARs for identifying hazardous waste. However, if the site waste meets the definition of hazardous waste under Cal. Code Regs. tit. 23, § 2521, other Chapter 15 requirements may be ARARs for discharging waste to land including landfill requirements.

Section 2550.4 of Chapter 15 has also been identified by the state as a potential ARAR for soil cleanup levels for hazardous waste. This section is essentially the same as federal ARARs identified at Cal. Code Regs. tit. 22, § 66264.94(a)(1)(3), (c), (d), and (e). Therefore, Section

2550.4 is not an ARAR for soil cleanup levels at IR Site 42. See Table A4-3 for a comparison of Chapter 15 requirements with parallel Cal. Code Regs. tit. 22 requirements.

Cal. Code Regs. tit. 27, div. 2, subdiv. 1

Former Cal. Code Regs. tit. 23, div. 3, ch. 15 requirements that have been repealed and went into effect on 18 July 1997, the following sections define waste characteristics for discharge of waste to land. These requirements may be applicable for soil left in place that was discharged after the effective date of the requirements. They are not potentially applicable to discharges before that date but may be relevant and appropriate.

Cal. Code Regs. tit. 27, § 20230(a) defines inert waste as waste "that does not contain hazardous waste or soluble pollutants at concentrations in excess of applicable water quality objectives, and does not contain significant quantities of decomposable waste." Cal. Code Regs. tit. 27, § 20230(b) states that "inert wastes do not need to be discharged at classified waste management units." Cal. Code Regs. tit. 27, § 20230(a) and (b) may be potential state ARARs for soil that meets the definition of inert waste. Since inert waste does not need to be disposed at a classified unit, it might be used for fill or other purposes.

Cal. Code Regs. tit. 27, §§ 20210 and 20220 are state definitions for designated waste and non-hazardous waste, respectively. These may be ARARs for soil that meets the definitions. These soil classifications determine state classification and siting requirements for discharging waste to land.

Cal. Code Regs. tit. 27, § 20400(a), (c), (d), (e), and (g) have been identified by the state as potential monitoring and cleanup concentration limit ARARs for waste soil other than hazardous waste. This section is also not more stringent than federal ARARs at Cal. Code Regs. tit. 22, § 66264.94(a)(1) and (3), (c), (d), and (e). Therefore, Cal. Code Regs. tit. 27, § 20400 is not an ARAR for soil at IR Site 42**.** See Table A4-3 for a comparison of Chapter 15 requirements with parallel Cal. Code Regs. tit. 22 requirements.

Cal. Health & Safety Code § 25157.8

This law requires wastes that contain total lead in excess of 350 ppm, copper in excess of 2,500 ppm, or nickel in excess of 200 ppm to be disposed in a Class I landfill. The level for lead is the only one that is more stringent than its respective TTLC.

This statute is not applicable ARAR because waste generated during the removal action will be disposed of off-site. This is a sunset provision at § 25157.8(e) that states that the statute is only in effect until 01 July 2006.

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A3.0 LOCATION-SPECIFIC ARARS

Potential location-specific ARARs are identified and discussed in this section. The discussions are presented based on various attributes of the site location, such as whether it is within a floodplain. Additional surveys will be performed in connection with the response action design and response action to confirm location-specific ARARs where inadequate siting information currently exists, or in the event of changes to planned facility locations.

A3.1 SUMMARY OF LOCATION-SPECIFIC ARARs

Cultural and other natural resources are the resource categories relating to location-specific requirements potentially affected by the IR Site 42 removal action alternatives. The conclusions for ARARs pertaining to these resources are presented in the following sections.

A3.1.1 Cultural Resources ARARs Conclusions

There are no cultural resources ARARs for the proposed removal action alternatives for IR Site 42. Table A3-1 lists the requirements evaluated with brief discussions of ARAR status.

A3.1.2 Wetlands Protection and Floodplain Management Conclusions

The proposed removal action at IR Site 42 lays within the low-lying, relatively flat area of the NWR wetlands. Flooding brought about by a 100-year or a 500-year occurrence would impact low-lying areas. The requirements for wetlands protection and floodplain management are potentially applicable. Table A3-1 lists the requirements evaluated with brief discussions of ARAR status.

A3.1.3 Hydrologic Resources Conclusions

There are no hydrologic resources ARARs for the proposed removal action alternatives for IR Site 42. Table A3-1 lists the requirements evaluated with brief discussions of ARAR status.

A3.1.4 Biological Resources Conclusions

Several bird species, listed as endangered by either federal or state agencies, are known to inhibit NAVWPNSTA Seal Beach, the NWR, and its associated wetlands. They include the California

brown pelican, Swainson's hawk, Peregine falcon, Aleutian Canada goose, light-footed clapper rail, Western Snowy plover, California least tern, and Belding's savannah sparrow. The breeding season for these species extends from approximately March to September (CH2M Hill 2002).

There are no known reported sightings of these species at the site designated for the removal action. The proposed remedial alternatives are expected to mitigate potential threats to endangered species. However, substantive requirements of the Endangered Species Act of 19732 have been identified as relevant and appropriate. Migratory birds have been observed at NAVWPNSTA Seal Beach, but the proposed remedial alternatives at IR Site 42 could potentially impact breeding of Belding's Savannah sparrows and light-footed clapper rails that nest in the area. Both species' breeding seasons are from March through August at NAVWPNSTA Seal Beach. Timing the removal action to coincide with non-breeding periods would eliminate the potential for harming these endangered species. Substantive requirements of the National Wildlife Refuge System Administration Act of 1996 have been identified as potentially applicable.

Accordingly, the substantive provisions of California Fish and Game Code 1908 regarding the take of rate or endangered native plants are potentially relevant and appropriate to the proposed remedial alternatives. Section 2080 of the California Fish and Game Code prohibits the take of endangered species and is a potentially applicable ARAR because five species, listed as endangered by either federal of state agencies, are known to inhabit NAVWPNSTA Seal Beach, the NWR, and its associated wetlands.

Proposed removal options for IR Site 42 do not entail the taking of animals or birds. However, the substantive requirements of California Fish and Game Code (Cal. Fish & Game Code) § 3005(a) regarding the taking of birds and mammals are potentially relevant and appropriate.

A3.1.5 Coastal Resources Conclusions

There are no coastal resources ARARs for the proposed removal action alternatives for IR Site 42. Tables A3-1 and A3-2 list the requirements evaluated with brief discussions of ARAR status.

A3.1.6 Geologic Characteristics Conclusions

There are no geologic ARARs for the proposed removal action alternatives for IR Site 42. Table A3-1 lists the requirements evaluated with brief discussions addressing ARAR status.

A3.2 DETAILED DISCUSSION OF ARARs

The following subsections provide a detailed discussion of federal and state ARARs by location-specific resources. Pertinent and substantive provisions of the potential ARARs listed and described below were reviewed to determine whether they are potential federal or state ARARs for the IR Site 42 soil EE/CA.

Requirements that are determined to be ARARs or TBCs are identified in Table A3-1 (federal) and Table A3-2 (state) at the end of this section. ARARs determinations are presented in the column denoted by the heading ARAR Determination. Determinations of status for location-specific ARARs were generally based on consultation of maps or lists included in the regulation or prepared by the administering agency. References to the document or agency consulted are provided in the Comments column and may be provided in footnotes to the table. Specific issues concerning some of the requirements are discussed in the following sections.

A3.2.1 Wetlands Protection and Floodplains Management ARARs

The area of concern at IR Site 42 is within the salt marsh wetland area. The following federal wetlands and floodplains management ARARs were evaluated:

- Executive Order (Exec. Order No.) 11990, Protection of Wetlands (40 C.F.R. § 6.302[a]);
- Exec. Order No. 11988, Floodplain Management (40 C.F.R. § 6.302[b]);
- Clean Water Act, Section 404, 33 U.S.C. § 1344; and/or
- RCRA (42 U.S.C. §§ 6901–6991[i]), Cal. Code Regs. tit. 22, § 66264.18(b).]

A3.2.1.1 FEDERAL

Protection of Wetlands, Exec. Order No. 11990

Exec. Order No. 11990 requires that federal agencies minimize the destruction, loss, or degradation of wetlands; preserve and enhance the natural and beneficial value of wetlands; and

avoid support of new construction in wetlands if a practicable alternative exists. Exec. Order No. 11990 is codified at 40 C.F.R. § 6.302(a). The substantive provisions of 40 C.F.R. § 6.302(a) are potential ARARs for the proposed removal action at IR Site 42.

Floodplain Management, Exec. Order No. 11988

Under 40 C.F.R. § 6.302(b), federal agencies are required to evaluate the potential effects of action they may take in a floodplain to avoid, to the extent possible, adverse effects associated with direct and indirect development of a floodplain. Flooding brought about by a 100-year or 500-year occurrence would potentially impact the removal action area at IR Site 42. The substantive provisions of 40 C.F.R. § 6.302(b) are potential ARARs for the proposed removal action at IR Site 42.

Clean Water Act (33 U.S.C. § 1344)

Section 404 of the Clean Water Act of 1977 governs the discharge of dredged and fill material into waters of the United States, including adjacent wetlands. Wetlands are areas that are inundated by water frequently enough to support vegetation typically adapted for life in saturated soil conditions. Wetlands include swamps, marshes, bogs, sloughs, potholes, wet meadows, river overflows, mudflats, natural ponds and similar areas. Both the U.S. EPA and the U.S. Army Corps of Engineers have jurisdiction over wetlands. U.S. EPA's Section 404 guidelines are promulgated in 40 C.F.R. § 230, and the U.S. Army Corps of Engineer's guidelines are promulgated in 33 C.F.R. § 320. Discharge of dredged or fill material to a wetland is not planned as part of the proposed removal action therefore the substantive provisions of this act are not an ARAR.

Resource Conservation and Recovery Act (42 U.S.C. §§ 6901–6991[i])

Under Cal. Code Regs. tit. 22, § 66264.18(b), any hazardous waste facility located in a 100-year floodplain or within the maximum high tide must be designed, constructed, operated, and maintained to prevent washout of any hazardous waste by a 100-year flood or maximum high tide, unless the owner or operator can demonstrate that procedures are in effect that will cause the waste to be removed safely, before flood or tidewater can reach the facility. IR Site 42 is

within a floodplain area but does not contain RCRA-regulated units therefore the substantive provisions of this act are not an ARAR.

A3.2.1.2 STATE

The state RCRA requirements for floodplains are evaluated above as potential federal ARARs.

A3.2.2 Hydrologic Resources ARARs

No potential location-specific state ARARs were identified for hydrologic resources because there will be no discharge to waters for the state as a result of the proposed removal action.

The following federal requirements should be evaluated for the site as appropriate:

- Wild and Scenic Rivers Act (substantive provisions of 16 U.S.C. §§ 1271–1287),
- Fish and Wildlife Coordination Act (substantive provisions of 16 U.S.C. §§ 661–666c), and/or
- Rivers and Harbors Act of 1899 (substantive provisions of 33 U.S.C. §§ 401–413).]

A3.2.2.1 WILD AND SCENIC RIVERS ACT

The Wild and Scenic Rivers Act (WSRA) (16 U.S.C. §§ 1271–1287) establishes requirements applicable to water resource projects affecting wild, scenic, or recreational rivers within the National Wild and Scenic Rivers System, as well as rivers designated on the National Rivers Inventory to be studied for inclusion on the national system. In accordance with Section 7 of the act, a federal agency may not assist, through grant, loan, license, or otherwise, the construction of a water resources project that would have a direct and adverse effect on the free-flowing, scenic, and natural values for which a river on the national system or a study river on the National Rivers Inventory was established. The act also covers indirect effects from construction of water resources projects below or above rivers or their tributaries that are in the national system or under study on the National Rivers Inventory, such as a dam on a tributary and construction or development on adjacent shorelines. Adverse impacts must be mitigated, and

coordination may be required with the National Park Service and Department of Agriculture. The proposed removal action for IR Site 42 will not impact wild, scenic, or recreational rivers; therefore this act is not an ARAR.

A3.2.2.2 FISH AND WILDLIFE COORDINATION ACT

The Fish and Wildlife Coordination Act (16 U.S.C. §§ 661–666c) was enacted to protect fish and wildlife when federal actions result in the control or structural modification of a natural stream or body of water. The statute requires federal agencies to take into consideration the effect a water-related project would have on fish and wildlife and take action to prevent loss or damage to these resources. The proposed removal action will not modify a stream or other water body nor affect fish or wildlife; therefore, the substantive requirements or this act are not an ARAR.

A3.2.2.3 RIVERS AND HARBORS ACT OF 1899

Section 10 of the Rivers and Harbors Act of 1899 prohibits the creation of any obstruction not authorized by Congress to the navigable capacity of any of the waters of the United States (33 U.S.C. §§ 401–413). It prohibits construction of wharves, piers, booms, weirs, breakwaters, bulkheads, jetties, or other structures in a port unless the construction is approved by the U.S. Army Corps of Engineers. In addition, excavation or filling of any port, harbor, channel, lake, or any navigable water is prohibited without authorization. Section 10 permits are required for these activities. Section 10 permits cover construction, excavation, or deposition of materials in, over, or under navigable waters, or any work that would affect the course, location, condition, or capacity of those waters. The proposed removal action will not affect navigable waters; therefore, the substantive requirements of this act are not an ARAR.

A3.2.3 Biological Resources ARARs

The following requirements were evaluated as potential ARARs for the site:

- Endangered Species Act of 1973 (substantive provisions of 16 U.S.C. §§ 1531–1543),
- Migratory Bird Treaty Act of 1972 (substantive provisions of 16 U.S.C. §§ 703–712),

- Marine Mammal Protection Act (substantive provisions of 16 U.S.C. §§ 1361–1421h),
- Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801–1882),
- National Wildlife Refuge System Administration Act of 1996 (16 U.S.C. § 668dd–668ee, substantive provisions of 50 C.F.R. § 27.11–27.97),
- Wilderness Act (16 U.S.C. §§ 1131–1136, 50 C.F.R. § 35.1–35.14), and/or
- California Endangered Species Act (Cal. Fish & Game Code, ch. 1.5, §§ 2050–2116).]

A3.2.3.1 FEDERAL

Endangered Species Act of 1973

The Endangered Species Act (ESA) of 1973 (16 U.S.C. §§ 1531–1543) provides a means for conserving various species of fish, wildlife, and plants that are threatened with extinction. The ESA defines an endangered species and provides for the designation of critical habitats. Federal agencies may not jeopardize the continued existence of any listed species or cause the destruction or adverse modification of critical habitat. Under Section 7(a) of the ESA, federal agencies must carry out conservation programs for listed species. The Endangered Species Committee may grant an exemption for agency action if reasonable mitigation and enhancement measures such as propagation, transplantation, and habitat acquisition and improvement are implemented. Consultation regulations at 50 C.F.R. § 402 are administrative in nature and are therefore not ARARs. However, they may be TBCs to comply with the substantive provisions of the ESA. Several bird species listed as endangered by either federal or state agencies are known to inhabit NAVWPNSTA Seal Beach, the NWR, and its associated wetlands. There are no known reported sightings of these species at the site designated for the removal action. The proposed removal action is expected to mitigate potential threats to endangered species; however, substantive requirements have been identified as potentially relevant and appropriate.

Migratory Bird Treaty Act of 1972

The Migratory Bird Treaty Act (16 U.S.C. §§ 703–712) prohibits at any time, using any means or manner, the pursuit, hunting, capturing, and killing or attempting to take, capture, or kill any

migratory bird. This act also prohibits the possession, sale, export, and import of any migratory bird or any part of a migratory bird, as well as nests and eggs. A list of migratory birds for which this requirement applies is found at 50 C.F.R. § 10.13. It is the DON's position that this act is not legally applicable to DON actions; however, Exec. Order No. 13186 (dated 10 January 2001) requires each federal agency taking actions that have or are likely to have a measurable effect on migratory bird populations to develop and implement, within 2 years, a memorandum of understanding (MOU) with the United States Fish and Wildlife Service (USFWS) to promote the conservation of such populations. The DoD and the USFWS are in the process of negotiating this MOU. In the meantime, the Migratory Bird Treaty Act will continue to be evaluated as a potentially relevant and appropriate requirement for DON CERCLA response actions. Migratory birds have been observed at NAVWPNSTA Seal Beach, but the proposed removal action is not expected to impact migratory birds; however, substantive requirements may be potentially relevant and appropriate to the proposed removal action for the site.

Marine Mammal Protection Act

The Marine Mammal Protection Act (16 U.S.C. §§ 1361–1421h) prohibits the taking of a marine mammal on the high seas or in a harbor or other place under the jurisdiction of the United States. It prohibits the possession, transport, and sale of a mammal or marine mammal product, unless authorized under law. The prohibitions that are potentially pertinent to CERCLA actions are at 16 U.S.C. § 1372(a)(2). IR Site 42 is located inland; therefore marine mammals are not present. The substantive provisions of this act are not an ARAR.

Magnuson-Stevens Fishery Conservation and Management Act of 1976, as Amended

The purpose of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801–1882) is to conserve and manage the fishery resources found off the coasts of the United States, the anadromous species, and the continental shelf fishery resources of the United States. It establishes a fishery conservation zone within which the United States has exclusive fishery management prerogatives.

IR Site 42 is located inland; therefore fisheries will not be impacted. The substantive provisions of this act are not an ARAR.

National Wildlife Refuge System Administration Act of 1966

The National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. § 668dd–668ee) and it's implementing regulations at 50 C.F.R. §§ 25–37 establish wildlife refuges that are maintained for the primary purpose of developing a national program of wildlife and ecological conservation and rehabilitation. These refuges are established for the restoration, preservation, development, and management of wildlife and wild land habitats; protection and preservation of endangered or threatened species and their habitats; and management of wildlife and wild lands to obtain the maximum benefit from these resources.

The National Wildlife Refuge System Administration Act contains the following substantive requirements that are potential ARARs. The act prohibits any person from disturbing, injuring, cutting, burning, removing, destroying, or possessing any property within any area of a wildlife refuge. The act also prohibits the taking or possessing of any fish, bird, mammal or other wild vertebrate or invertebrate animals, or nest or eggs within any refuge area or otherwise occupying any such area unless such activities are done with a permit or permitted by express provision of law. The act also regulates the use of audio equipment as well as motorized vehicles, aircraft, and boats in wildlife refuges. It prohibits construction activities, disposal of waste, and the introduction of plants and animals into any wildlife refuge. The prohibitions under the act are codified at 50 C.F.R. § 27. The removal action at IR Site 42 could potentially impact breeding of several bird species that nest in the area. The species' breeding seasons are from March through September at NAVWPNSTA Seal Beach. Timing the removal action to coincide with non-breeding periods would eliminate the potential for harming these endangered species. Substantive requirements of this act have been identified as potentially relevant and applicable.

Wilderness Act

The Wilderness Act (16 U.S.C. § 1131) and its accompanying implementing regulations (50 C.F.R. § 35.1–35.14) create the National Wilderness Preservation System. The intent of the law is to administer and manage units of this system (i.e., wilderness areas) in order to preserve their wilderness character and to leave them unimpaired for future use as wilderness. IR Site 42 is not located on federally owned wilderness area. The substantive provisions of this act are not an ARAR.

A3.2.3.2 STATE

California Endangered Species Act

The California Endangered Species Act is codified in the California Fish and Game Code (Cal. Fish & Game Code) §§ 2050–2116. It is the DON's position that the requisite federal sovereign immunity waiver does not exist to authorize applicability of the California Endangered Species Act. Nevertheless, this act will be evaluated as a potentially relevant and appropriate requirement for the DON's CERCLA response actions. Cal. Fish & Game Code § 2080 prohibits the take of endangered species.

The substantive provisions of Cal. Fish & Game Code § 2080 are potentially relevant and appropriate requirements for the proposed removal action. The response action will be designed to minimize potential effects on these endangered species.

The list of plants and animals of California declared to be endangered are found in Cal. Code Regs. tit. 14, §§ 670.2 and 670.5. These requirements are not a "cleanup standard, standard of control," or "other substantive requirement, criteria, or limitation" (CERCLA Section 121, 42 U.S.C. § 9621). Therefore, Cal. Code Regs. tit. 14, §§ 670.2 and 670.5 are not potential ARARs. The lists are incorporated by reference into other potential state ARARs (e.g., Cal. Fish & Game Code § 2080).

A3.2.4 Coastal Resources ARARs

There are no coastal resources ARARs for the proposed removal action alternatives for IR Site 42; however, the following requirements were reviewed as potential ARARs for this EE/CA:

- Coastal Zone Management Act (substantive provisions of 16 U.S.C. §§ 1451–1464, 15 C.F.R. § 930), and/or
- California Coastal Act of 1976 (Cal. Pub. Res. Code §§ 30000–30900; Cal. Code Regs. tit. 14, §§ 13001–13666.4).

A3.2.4.1 FEDERAL

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) (16 U.S.C. §§ 1451–1464) specifically excludes federal lands from the coastal zone (16 U.S.C. § 1453[1]). Therefore, the CZMA is not potentially applicable to IR Site 42. The CZMA will be evaluated as a potentially relevant and appropriate requirement. Section 1456(a)(1)(A) requires each federal agency activity within or outside the coastal zone that affects any land or water use or natural resource to conduct its activities in a manner that is consistent to the maximum extent practicable with enforceable policies of approved state management policies. A state coastal zone management program is developed under state law guided by the CZMA and its accompanying implementing regulations in 15 C.F.R. § 930. A state program sets forth objectives, policies, and standards to guide public and private uses of lands and water in the coastal zone. See Section A3.2.5.2 for the state coastal zone management program.

A3.2.4.2 STATE

California Coastal Act of 1976

The California Coastal Act is codified at Public Resources Code (Cal. Pub. Res. Code) §§ 30000–30900 and Cal. Code Regs. tit. 14, §§ 13001–13666.4. These sections regulate activities associated with development to control direct significant impacts on coastal waters and to protect state and national interests in California coastal resources. Since federal lands are specifically excluded from the definition of coastal zone, the California Coastal Act is not potentially applicable to IR Site 42**,** but is evaluated further as a potentially relevant and appropriate requirement. The California Coastal Act policies set forth in the act constitute the standards used by the California Coastal Commission in its coastal development permit decisions and for the review of local coastal programs. These policies contain the following substantive requirements: protection and expansion of public access to the shoreline and recreation opportunities (Cal. Pub. Res. Code §§ 30210–30224); protection, enhancement, and restoration of environmentally sensitive habitats including inter-tidal and near-shore waters, wetlands, bays and estuaries, riparian habitat, grasslands, streams, lakes, and habitat for rare or endangered plants or animals (Cal. Pub. Res. Code §§ 30230–30240), protection of productive agricultural lands, commercial fisheries, and archaeological resources (Cal. Pub. Res. Code §§ 30234,

30241–30244), protection of the scenic beauty of coastal landscapes (Cal. Pub. Res. Code § 30251), and provisions for expansion, in an environmentally sound manner, of existing industrial ports and electricity-generating power plants (Cal. Pub. Res. Code § 30264).

A3.2.5 Geologic Characteristics ARARs

There are no potential federal or state geologic requirements identified based on location. The following geologic characteristic requirements were evaluated as potential ARARs for the site:

- RCRA (42 U.S.C. §§ 6901–6991[i[), hazardous waste facility siting criteria, Cal. Code Regs. tit. 22, §§ 66264.18(a) and (c)]

A3.2.5.1 FEDERAL

Resource Conservation and Recovery Act (42 U.S.C. §§ 6901–6991[i])

Hazardous waste facilities must be sited in accordance with the following requirements:

- Seismic considerations (Cal. Code Regs. tit. 22, § 66264.18(a) – portions of new facilities or facilities undergoing substantial modification where transfer, treatment, storage or disposal of hazardous waste will be conducted shall not be located within 61 meters (200 feet) of a fault which has had displacement in Holocene time.

- Salt dome formations, salt bed formations, underground mines and caves (Cal. Code Regs. tit. 22, § 66264.18[c]) – the placement of any non-containerized or bulk liquid hazardous waste in any salt dome formation, salt bed formation, or underground mine or cave is prohibited.

Site 42 is not located within 61 meters of a Holocene fault and no discharge is proposed to a salt dome formation, salt bed formation, or underground mines or caves. Therefore, the requirements at Cal. Code Regs. tit. 22, § 66264.18(a) and § 66264.18(c) are not potential ARARs for this response action.

A3.2.5.2 STATE

The state location-specific RCRA requirements for geologic characteristics are evaluated above as potential federal ARARs.

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A4.0 ACTION-SPECIFIC ARARs

This EE/CA report evaluates removal action alternatives for IR Site 42 NAVWPNSTA Seal Beach. This ARARs analysis is based on three alternatives for the site. Alternative 1 is no action, Alternative 2 entails partial excavation with off-site disposal, and Alternative 3 entails excavation with off-site disposal. Detailed descriptions of the removal alternatives are provided in the main text of this EE/CA report.

Tables A4-1 and A4-2 at the end of this section present and evaluate federal and state potential action-specific ARARs, respectively, for IR Site 42. A discussion of the requirements determined to be pertinent to each alternative being evaluated for IR Site 42 is presented in this section. A discussion of how the alternative complies with each identified ARAR is also provided.

A4.1 ALTERNATIVE 1, NO ACTION

There is no need to identify ARARs for the no action alternative because ARARs apply to "any removal or remedial action conducted entirely on-site" and "no action" is not a removal or remedial action (CERCLA Section 121(e), 42 U.S.C. § 9621[e]). CERCLA § 121 (42 U.S.C. § 9621) cleanup standards for selection of a Superfund remedy, including the requirement to meet ARARs, are not triggered by the no action alternative (U.S. EPA 1991b). Therefore, a discussion of compliance with action-specific ARARs is not appropriate for this alternative.

A4.2 ALTERNATIVE 2, PARTIAL EXCAVATION WITH OFF-SITE DISPOSAL

Discussions of compliance with federal and state action-specific ARARs for Alternative 2 are presented in the following sections.

A4.2.1 Federal

The key threshold question for soil ARARs is whether or not the waste generated during the removal action at IR Site 42 would be classified as a hazardous waste. The soil may be classified as federal hazardous waste as defined by RCRA and the state-authorized program, as non-RCRA state-regulated hazardous waste, or as non-hazardous waste. If the soil is determined to be hazardous waste, the appropriate requirements will apply. Comparing the site waste to the

definition of RCRA hazardous waste can make the determination of whether a waste is a RCRA hazardous waste. The RCRA requirements at Cal. Code Regs. tit. 22, §§ 66262.10(a), 66262.11, 66264.13(a) and (b), and 66262.34 are potentially applicable ARARs because they identify the RCRA hazardous waste requirements associated with generation and on-site accumulation.

For drip pad design, construction, monitoring, and closure, Cal. Code Regs. tit. 22, § 66265.443, 66265.444, and 66265.445 requirements for accumulating waste piles on-site for less than 90 days were evaluated. The substantive requirements are potentially applicable ARARs for accumulating waste generated during the removal action, and for characterization and staging prior to off-site disposal.

SCAQMD Rule 403 applies to any source of dust or fumes, including lead-contaminated soil. The rule states activities shall not cause or allow emissions of fugitive dust such that the presence of such dust remains visible in the atmosphere beyond the property line of the emission source and shall not cause or allow levels of particulate matter less than 10 micrometers in diameter to exceed 50 micrograms per cubic meter when determined, by simultaneous sampling, as the difference between upwind and downwind samples. This rule is potentially applicable to removal activities at the site.

A4.2.2 State

Actions impacting birds or mammals are regulated in Cal. Fish & Game Code § 3005(a). These requirements prohibit the taking of birds and mammals, including the taking by poison. Though it is not anticipated that birds or mammals will be taken during removal activities at IR Site 42, the substantive provisions pertaining to the take of birds or mammals with a poisonous substance are potentially applicable.

SCAQMD Rule 402 for nuisance emissions was evaluated as a potential ARAR for the potential air emissions at IR Site 42. This is not a potential federal ARAR because it is not included in the Site Inspection Plan. The nuisance standard states that a person shall not discharge from any source such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to a considerable number of persons or to the public.

The nuisance rule includes subjective, non-environmental criteria such as "annoyance," "comfort," and "repose." As such, the DON is troubled by the vague and subjective nature of the nuisance rule and the lack of objective "standards, requirements, criteria, or limitations" within the meaning of Section 121(d)(2) of CERCLA. Other federal and state ARARs addressing actual and potential air emissions will assure adequate protection of human health and the environment. SCAQMD Rule 402 was determined to be not an ARAR.

A4.3 ALTERNATIVE 3, EXCAVATION WITH OFF-SITE DISPOSAL

The potential ARARs associated with the removal activities of this proposed removal alternative were discussed in Section A4.2 above.

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A5.0 SUMMARY

Controlling ARARs have been identified in the text of this appendix for each medium, location, and proposed response action.

The substantive provisions of the following requirements were identified as potential ARARs that affected the development of removal action objectives for IR Site 42:

- Resource Conservation and Recovery Act (RCRA) hazardous waste requirements at Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100;
- Characterization of solid waste as toxic based on TCLP at 40 C.F.R. 261.24(a) and Cal. Code Regs. tit. 22, § 66261.24(a)(1)(B);
- Cal. Fish & Game Code § 3005(a) regarding the taking of birds and mammals;
- Cal. Fish & Game Code § 3503 prohibits the take or needless destruction of the nest or eggs of any bird;
- Cal. Fish & Game Code § 3511 prohibits the take or possession of fully protected birds; Cal. Fish & Game Code § 5650 regarding the discharge of toxic materials into state waters;
- RCRA on-site waste generation at Cal. Regs. tit.22, §§ 66262.10(a), 66262.11.11, 66264.13(a) and (b);
- RCRA hazardous waste accumulation requirements at Cal. Code Regs. tit.22, §§ 66262.34;
- RCRA drip pad design at Cal. Regs. tit.22, §§ 66265.443, 66265.444, and 66265.445;
- SAQMD Rule 403;
- Floodplain Management, Executive Order 11988 and;
- National Wildlife Refuge System Administration Act of 1966, 16 U.S.C 668dd-668ee.

In cases of soil excavation, sufficient data must be available to evaluate whether the material could be classified as a hazardous waste. Comparing the site waste to the definition of RCRA hazardous waste can make the determination of whether a waste is a RCRA hazardous waste.

The RCRA requirements at Cal. Code Regs. tit. 22, §§ 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100 are potentially applicable ARARs because they define RCRA hazardous waste.

The requirements under 40 C.F.R. 261.24(a) and Cal. Code Regs. tit. 22, § 66261.24(a)(1)(B) are applicable for determining if a solid waste is characterized as toxic. The determination is based on the TCLP; if the contaminant concentrations in the solid waste TCLP extract exceed the TCLP limits, the waste is determined to be a characteristic RCRA hazardous waste (see Section B1.4.1).

Actions impacting birds or mammals are regulated in Cal. Fish & Game Code § 3005(a). These requirements prohibit the taking of birds and mammals, including the taking by poison. Though it is not anticipated that birds or mammals will be taken during removal activities at IR Site 42, the substantive provisions pertaining to the take of birds or mammals with a poisonous substance are potentially relevant and appropriate location-specific ARARs and potentially applicable action-specific ARARs. The Cal. Fish & Game Code § 3503 prohibits the taking, possession, or needless destruction of the nest or eggs of any bird. Although the removal area is not within a nesting area, the site location inside the NWR makes the substantive provision potentially relevant and appropriate ARARs

The Cal. Fish & Game Code § 3511 prohibits the taking of fully protected birds. The habitat within the NWR at IR Site 42 is of poor quality and fully protected birds and/or their habitats have not been observed at IR Site 42. Fully protected birds have been observed within the NWR, therefore this provision is potentially applicable

The Cal. Fish & Game Code § 5650 prohibits the discharge of materials that have a deleterious effect on species or habitat. The excavation of contaminated soil from IR Site 42 will be temporarily stockpiled at the site. The substantive provisions are potentially relevant and appropriate ARARs.

In cases where on-site hazardous waste is generated, there is a potential for excavated soils to be classified as RCRA hazardous waste due to localized concentrations of lead. The determination of whether the wastes generated during removal activities are hazardous will be made at the time

the wastes are generated. The requirements for determining whether the waste is a hazardous waste are found under Cal. Code Regs. tit. 22, § 66262.10(a) and 66262.11, and the requirements for analyzing the waste to determine whether the waste is hazardous are found under Cal. Code Regs. tit. 22, § 66264.13(a) and (b).

For any operations where hazardous waste is generated, on-site hazardous waste accumulation is allowed under Cal. Code Regs. tit. 22, § 66262.34 for up to 90 days as long as the waste is stored in containers or tanks, on drip pads, inside buildings, is labeled and dated, etc.

Drip pad design, construction, monitoring, and closure requirements found in Cal. Code Regs. tit. 22, § 66265.443, 66265.444, and 66265.445 allow generators to accumulate waste on-site for characterization and staging prior to off-site disposal for up to 90 days.

SCAQMD Rule 403 applies to any source of dust or fumes, including lead-contaminated soil. The rule states activities shall not cause or allow emissions of fugitive dust such that the presence of such dust remains visible in the atmosphere beyond the property line of the emission source and shall not cause or allow levels of particulate matter less than 10 micrometers in diameter to exceed 50 micrograms per cubic meter when determined, by simultaneous sampling, as the difference between upwind and downwind samples. This rule is potentially applicable to removal activities at the site.

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A6.0 REFERENCES

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U.S. EPA. *See* United States Environmental Protection Agency.

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Table A2-1
Potential Federal Chemical-Specific[a] ARARs by Medium

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
		GROUNDWATER		
Safe Drinking Water Act (42 U.S.C., ch. 6A, § 300[f]–300[j]-26)[c]				
National primary drinking water standards are health-based standards for public water systems (MCLs).	Public water system.	40 C.F.R. § 141.11–141.13, excluding § 141.11(d)(3), 141.15, 141.16, 141.61(a) and (c), and 141.62(b)	Not an ARAR	The NCP defines MCLs as relevant and appropriate for groundwater determined to be a current or potential source of drinking water in cases where MCLGs are not ARARs. However, groundwater is not included in the scope of this EE/CA. There is no indication that waste constituents have been released, or that there is the potential for release to groundwater.
MCLGs pertain to known or anticipated adverse health effects (also known as recommended MCLs).	Public water system.	40 C.F.R. § 141.50–141.51	Not an ARAR	MCLGs that have nonzero values may be relevant and appropriate for groundwater determined to be a current or potential source of drinking water. However, groundwater is not included in the scope of this EE/CA. There is no indication that waste constituents have been released, or that there is the potential for release to groundwater.
National secondary drinking water regulations are standards for the aesthetic qualities of public water systems (SMCLs).	Public water system.	40 C.F.R. § 143.3	Not an ARAR	SMCLs are federal contaminant levels intended as guidelines for the states. Because they are not enforceable, federal SMCLs are not ARARs.
Resource Conservation and Recovery Act (42 U.S.C., ch. 82, §§ 6901–6991[i])[c]				
Definition of RCRA hazardous waste. A solid waste is characterized as toxic based on the TCLP, if the waste exceeds the TCLP maximum concentrations.	Waste.	Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100	Not an ARAR	Applicable for determining whether waste is hazardous. However, groundwater is not included in the scope of this EE/CA. There is no indication that waste constituents have been released, or that there is the potential for release to groundwater.

Table A2-1 (continued)

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
Groundwater protection standards: Owners/operators of RCRA treatment, storage, or disposal facilities must comply with conditions in this section that are designed to ensure that hazardous constituents entering the groundwater from a regulated unit do not exceed the concentration limits for contaminants of concern set forth under Cal. Code Regs. tit. 22, § 66264.94 in the uppermost aquifer underlying the waste management area of concern at the POC.	A regulated unit that receives or has received hazardous waste before 26 July 1982 or regulated units that ceased receiving hazardous waste prior to 26 July 1982 where constituents in or derived from the waste may pose a threat to human health or the environment.	Cal. Code Regs. tit. 22, § 66264.94, except 66264.94(a)(2) and 66264.94(b)	Not an ARAR	Groundwater is not included in the scope of this EE/CA. In addition, the site is not a regulated unit, and there is no indication that waste constituents have been released, or that there is the potential for release to groundwater.
The POC is a vertical surface located at the hydraulically downgradient limit of the waste management area that extends through the uppermost aquifer underlying the regulated unit.	Hazardous waste treatment or disposal.	Cal. Code Regs. tit. 22, § 66264.95	Not an ARAR	The POC is a potential ARAR only when the RAO provides for achieving the cleanup level or concentration limit at and downgradient of the waste management area instead of throughout the contaminant plume. However, groundwater is not included in the scope of this EE/CA. There is no indication that waste constituents have been released, or that there is the potential for release to groundwater.
Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C., ch. 103, §§ 9601–9675)[c]				
ACLs using a point of exposure beyond the facility boundary.	Known or projected points of entry from groundwater to surface water.	CERCLA § 121(d)(2)(B)(ii) 42 U.S.C., ch. 103, § 9621	Not an ARAR	Groundwater is not included in the scope of this EE/CA. There is no indication that waste constituents have been released, or that there is the potential for release to groundwater.

Table A2-1 (continued)

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
Clean Water Act of 1977, as Amended (33 U.S.C., ch. 26, §§ 1251–1387)[c]				
National Ambient Water Quality Criteria.	Discharges to waters of the United States and groundwater.	33 U.S.C. § 1314(a) and 42 U.S.C. § 9621(d)(2) 64 Fed. Reg. 19781 (22 April 1999)	Not an ARAR	National Ambient Water Quality Criteria are not generally relevant and appropriate in selecting cleanup levels in groundwater. In addition, groundwater is not part of the scope of this EE/CA. There is no indication that waste constituents have been released, or that there is the potential for release to groundwater.
Water quality standards.	Discharges to waters of the United States.	40 C.F.R. § 131.36(b) and 131.38	Not an ARAR	There are no planned discharges to surface water from groundwater because groundwater is not included in the scope of this EE/CA. There is no indication that waste constituents have been released, or that there is the potential for release to groundwater.
SURFACE WATER				
Resource Conservation and Recovery Act (42 U.S.C., ch. 82, §§ 6901–6991[i])[c]				
Groundwater protection standards: Owners/operators of RCRA treatment, storage, or disposal facilities must comply with conditions in this section that are designed to ensure that hazardous constituents entering the groundwater from a regulated unit do not exceed the concentration limits for contaminants of concern set forth under Cal. Code Regs. tit. 22, § 66264.94 in the uppermost aquifer underlying the waste management area of concern at the POC.	A regulated unit that receives or has received hazardous waste before 26 July 1982 or regulated units that ceased receiving hazardous waste prior to 26 July 1982 where constituents in or derived from the waste may pose a threat to human health or the environment.	Cal. Code Regs. tit. 22, § 66264.94, except 66264.94(a)(2) and 66264.94(b)	Not an ARAR	Neither groundwater nor surface water is included in the scope of this EE/CA. There is no indication that waste constituents have been released, or that there is the potential for release to groundwater or surface water.

Table A2-1 (continued)

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
Safe Drinking Water Act (42 U.S.C., ch. 6A, § 300[f]–300[j]-26)[c]				
National primary drinking water standards are health-based standards for public water systems (MCLs).	Public water system.	40 C.F.R. § 141.11–141.13, excluding § 141.11(d)(3), 141.15, 141.16, 141.61(a) and (c), and 141.62(b)	Not an ARAR	The NCP defines MCLs as relevant and appropriate for surface water determined to be a current or potential source of drinking water in cases where MCLGs are not ARARs. However, surface water is not included in the scope of this EE/CA. There is no indication that waste constituents have been released, or that there is the potential for release to surface water.
Ensure safety of public water systems; remedial (or removal) actions must meet cleanup standards; MCLGs pertain to known or anticipated health effects (also known as recommended MCLs).	Public water system; remedial (or removal) activities impacting groundwater; groundwater that is a potential source of drinking water.	40 C.F.R. § 141.50–141.51	Not an ARAR	MCLGs that have nonzero values are relevant and appropriate for surface water determined to be a current or potential source of drinking water (NCP Section 300.430[e][2][I][B]–[D]). However, surface water is not included in the scope of this EE/CA. There is no indication that waste constituents have been released, or that there is the potential for release to surface water.
National secondary drinking water regulations are standards for the aesthetic qualities of public water systems (SMCLs).	Public water system.	40 C.F.R. § 143.3	Not an ARAR	SMCLs are federal contaminant levels intended as guidelines for the states. Because they are not enforceable, federal SMCLs are not ARARs.
Clean Water Act, as Amended (33 U.S.C., ch. 26, §§ 1251–1387)[c]				
National ambient water quality standards.	Discharges to waters of the United States.	40 C.F.R. § 131.36(b)	Not an ARAR	National ambient water quality standards would be applicable for any discharges to or cleanup of surface waters. However, there are no planned discharges to or cleanup of surface waters.

Table A2-1 (continued)

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
Effluent limitations that meet technology-based requirements, including BCPCT and BAT economically achievable.	Discharges to waters of the United States.	33 U.S.C., ch. 26, § 1311(b)(2)	Not an ARAR	There are no planned discharges to waters of the United States.
Water quality criteria.	Discharges to waters of the United States and groundwater.	33 U.S.C., ch. 26, § 1314(a) and 42 U.S.C., ch. 103, § 9621(d)(2) 64 Fed. Reg. 19781 (22 April 1999)	Not an ARAR	Federal water quality standards may be relevant and appropriate for any discharges to surface water. However, there are no planned discharges to surface waters.
Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C., ch. 103, §§ 9601–9675)[c]				
ACLs using a point of exposure beyond the facility boundary.	Known or projected points of entry from groundwater to surface water.	CERCLA Section 121(d)(2)(B)(ii) 42 U.S.C., ch. 103, § 9621	Not an ARAR	There are no planned discharges to surface water.
Resource Conservation and Recovery Act (42 U.S.C., ch. 82, §§ 6901–6991[i])[c]				
Definition of RCRA hazardous waste. A solid waste is characterized as toxic, based on the TCLP, if the waste exceeds the TCLP maximum concentrations.	Waste.	Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100	Not an ARAR	Applicable for determining whether waste is hazardous. However, surface water is not included in the scope of this EE/CA. There is no indication that waste constituents have been released, or that there is the potential for release to surface water.

Table A2-1 (continued)

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
SOIL				
Resource Conservation and Recovery Act (42 U.S.C., ch. 82, §§ 6901–6991[i])[c]				
Definition of RCRA hazardous waste. A solid waste is characterized as toxic, based on the TCLP, if the waste exceeds the TCLP maximum concentrations.	Waste.	Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100	Applicable	Applicable for determining whether waste is hazardous.
Groundwater Protection Standards: requirements to ensure that hazardous constituents entering the groundwater from a regulated unit do not exceed the concentration limits for contaminants of concern in the uppermost aquifer underlying the waste management area of concern at the POC.	A regulated unit that receives or has received hazardous waste before 26 July 1982 or regulated units that ceased receiving hazardous waste prior to 26 July 1982 where constituents in or derived from the waste may pose a threat to human health or the environment.	Cal. Code Regs. tit. 22, § 66264.94(a)(1) and (3), (c), (d), and (e)	Not an ARAR	The site is not a regulated unit and the proposed removal action does not include treatment, storage, or disposal on-site. There is no indication that waste constituents have been released or that there is the potential for release to groundwater.
LDRs prohibit disposal of hazardous waste unless treatment standards are met.	Hazardous waste land disposal.	Cal. Code Regs. tit. 22, § 66268.1(f)	Not an ARAR	There are no plans for land disposal of hazardous waste on-site.

Table A2-1 (continued)

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
Treatment standards including technology requirements before hazardous waste can be disposed to land.	Hazardous waste land disposal.	Cal. Code Regs. tit. 22, § 66268.40	Not an ARAR	There are no plans for land disposal of hazardous waste on-site.
Universal Treatment Standards used to comply with treatment standards.	Hazardous waste land disposal.	Cal. Code Regs. tit. 22, § 66268.48	Not an ARAR	There are no plans for land disposal of hazardous waste on-site.
Military Munitions Rule (40 C.F.R. pt. 266 subpt. M)[c]				
Identification of hazardous waste munitions and treatment and storage requirements for hazardous waste munitions.	Storage of military munitions.	40 C.F.R. pt. 266, subpt. M	Not an ARAR	Military munitions must be managed in accordance with 40 C.F.R. pt. 266 subpt. M requirements unless the waste meets the criteria set forth in 40 C.F.R. § 266.205(a)(1)(i)–(vii). This site does not currently store military munitions or have a history of storing munitions therefore this is not an ARAR.
Guidance for range UXO.	Applies to inactive, closed, or transferring ranges.	Range Rule Risk Methodology: Tools, Models, and Protocols (R3M)	Not an ARAR	This site is not an inactive, closed, or transferring range therefore this is not an ARAR.
SEDIMENT				
Resource Conservation and Recovery Act (42 U.S.C., ch. 82, §§ 6901–6991[i])[c]				
Definition of RCRA hazardous waste.	Waste.	Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100	Not an ARAR	Applicable for determining whether waste is hazardous. However, sediments are not included in the scope of this EE/CA.
A solid waste is characterized as toxic, based on the TCLP, if the waste exceeds the TCLP maximum concentrations.	Waste.	40 C.F.R. pt. 261.24(a) Cal. Code Regs. tit. 22, § 66261.24(a)(1)(B)	Not an ARAR	Applicable for determining whether waste is hazardous. However, sediments are not included in the scope of this EE/CA.

Table A2-1 (continued)

Clean Water Act, as Amended (33 U.S.C., ch. 26, §§ 1251–1387)[c]				
National ambient water quality standards.	Discharges to waters of the United States.	40 C.F.R. § 131.36(b) and 131.38	Not an ARAR	No federal or state action levels have been promulgated for chemical concentrations in sediment. However, sediments are not included in the scope of this EE/CA.
AIR				
Clean Air Act (42 U.S.C., ch. 85, §§ 7401–7671)[c]				
NAAQS: Primary and secondary standards for ambient air quality to protect public health and welfare (including standards for particulate matter and lead).	Contamination of air affecting public health and welfare.	40 C.F.R. § 50.4–50.12	Not an ARAR	Not enforceable and therefore not an ARAR.

Notes:

[a] many potential action-specific ARARs contain chemical-specific limitations and are addressed in the action-specific ARAR tables

[b] only the substantive provisions of the requirements cited in this table are potential ARARs

[c] statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the DON accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only pertinent substantive requirements of the specific citations are considered potential ARARs

Acronyms/Abbreviations:

ACL – alternative concentration limit
ARAR – applicable or relevant and appropriate requirement
BAT – best available technology
BCPCT – best conventional pollution control technology
Cal. Code Regs. – *California Code of Regulations*
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R. – *Code of Federal Regulations*
ch. – chapter
DON – Department of the Navy
EE/CA – engineering evaluation/cost analysis
Fed. Reg. – *Federal Register*
LDR – land disposal restriction
MCL – maximum contaminant level
MCLG – maximum contaminant level goal
NAAQS – National Ambient Air Quality Standards (primary and secondary)
NCP – National Oil and Hazardous Substances Pollution Contingency Plan
POC – point of compliance
pt. – part
RCRA – Resource Conservation and Recovery Act
§ – section

Table A2-1 (continued)

SMCL – secondary maximum contaminant level
TCLP – toxicity characteristic leaching procedure
tit. – title
U.S.C. – *United States Code*
APCD – Air Pollution Control District
COC – chemical of concern
CWA – Clean Water Act
DoD – Department of Defense
Fed. Reg. – *Federal Register*
NPDES – National Pollutant Discharge Elimination System
OU – operable unit
ppm – parts per million
ppm_w – parts per million by weight
pt. – part
R3M – Range Rule Risk Methodology
RAO – remedial action objective
RWQCB – (California) Regional Water Quality Control Board (South Coast)
SIP – State Implementation Plan
subpt. – subpart
TBC – to be considered
U.S. EPA – United States Environmental Protection Agency
UXO – unexploded ordnance
VOC – volatile organic compound

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Table A2-2
Potential State Chemical-Specific[a] ARARs by Medium

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
GROUNDWATER, SURFACE WATER, SOIL, SEDIMENTS, AND AIR				
Cal/EPA Department of Toxic Substances Control[c]				
Definition of "non-RCRA hazardous waste."	Waste.	Cal. Code Regs. tit. 22, § 66261.22(a)(3) and (4), § 66261.24(a)(2)–(a)(8), § 66261.101, § 66261.3(a)(2)(C) or § 66261.3(a)(2)(F)	Not an ARAR	Applicable for determining whether a waste is a non-RCRA hazardous waste. However, the soil subject to removal will be handled as potential RCRA hazardous waste during on-site activities.
State MCL list.	Source of drinking water.	Cal. Code Regs. tit. 22, §§ 64431 and 64444	Not an ARAR	Neither groundwater nor surface water is included in the scope of the EE/CA.
State secondary MCL list.	Source of drinking water.	Cal. Code Regs. tit. 22, § 64449(a)	Not an ARAR	Neither groundwater nor surface water is included in the scope of the EE/CA.
State and Regional Water Quality Control Boards[c]				
Authorizes the SWRCB and RWQCB to establish in water quality control plans beneficial uses and numerical and narrative standards to protect both surface water and groundwater quality. Authorizes regional water boards to issue permits for discharges to land or surface or groundwater that could affect water quality, including NPDES permits, and to take enforcement action to protect water quality.		Cal. Water Code, div. 7, §§ 13241, 13243, 13263(a), 13269, and 13360 (Porter-Cologne Water Quality Control Act)	Not an ARAR	Neither groundwater nor surface water is included in the scope of the EE/CA.

Table A2-2 (continued)

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
		Cal. Water Code, div. 7, § 13304	Not an ARAR	Section 13304 does not constitute an ARAR because it does not itself establish or contain substantive environmental "standards, requirements, criteria or limitations" (CERCLA 121) and is not in itself directive in intent. In addition, Section 13304 is not more stringent than the substantive requirements of the potential state and federal ARARs identified in this table and Table A2-1.
Describes the water basins in the Santa Ana region, establishes beneficial uses of groundwater and surface water, establishes WQOs, including narrative and numerical standards, establishes implementation plans to meet WQOs and protect beneficial uses, and incorporates statewide water quality control plans and policies.		Comprehensive Water Quality Control Plan for the Santa Ana Region (Basin Plan) (Cal. Water Code § 13240)	Not an ARAR	Neither groundwater nor surface water is included in the scope of the EE/CA. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.

Table A2-2 (continued)

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
Establishes the policy that high-quality waters of the state "shall be maintained to the maximum extent possible" consistent with the "maximum benefit to the people of the State." It provides that whenever the existing quality of water is better than that required by applicable water quality policies, such existing high-quality water will be maintained until it has been demonstrated to the state that any change will be consistent with maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies. It also states that any activity that produces or may produce a waste or increased volume or concentration of waste and that discharges or proposes to discharge to existing high-quality waters will be required to meet waste-discharge requirements that will result in the best practicable treatment or control of the discharge.		Statement of Policy With Respect to Maintaining High Quality of Waters in California, SWRCB Res. 68-16	Not an ARAR	Neither groundwater nor surface water is included in the scope of the EE/CA. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.
Describes requirements for RWQCB oversight of investigation and cleanup and abatement activities resulting from discharges of hazardous substances. RWQCB may decide on cleanup and abatement goals and objectives for the protection of water quality and beneficial uses of water within each region. Establishes criteria for "containment zones" where cleanup to established water-quality goals is not economically or technically practicable.		Policies and procedures for investigation and cleanup and abatement of discharges under Cal. Water Code § 13304; SWRCB Res. 92-49	Not an ARAR	Neither groundwater nor surface water is included in the scope of the EE/CA. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.

Table A2-2 (continued)

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
Incorporated into all regional board basin plans. Designates all groundwater and surface waters of the state as drinking water except where the total dissolved solids are greater than 3,000 ppm, the well yield is less than 200 gpd from a single well, the water is a geothermal resource or in a water conveyance facility, or the water cannot reasonably be treated for domestic use using either best management practices or best economically achievable treatment practices.		SWRCB Res. 88-63 (Sources of Drinking Water Policy)	Not an ARAR	Neither groundwater nor surface water is included in the scope of the EE/CA.
Establishes concentration limits for cleanup actions, including groundwater, surface water, and the unsaturated zones for other than hazardous waste at background. Allows a higher cleanup limit (but not to exceed MCLs) if background is not technically or economically achievable.		Cal. Code Regs. tit. 27, §§ 20380(a); 20400(a), (c), (d), (e), and (g); and 20405	Not an ARAR	The site is not a regulated unit and the proposed removal action does not include on-site treatment, storage, or disposal.
Establishes concentration limits for cleanup actions, including groundwater, surface water, and the unsaturated zones for hazardous waste at background. Allows a higher cleanup limit (but not to exceed MCLs) if background is not technically or economically achievable.		Cal. Code Regs. tit. 23, §§ 2550(a); 2550.4(d), (e), and (f); and 2550.5	Not an ARAR	Cal. Code Regs. tit. 23, § 2550(a) addresses the general applicability of other standards in Chapter 15 and does not contain standards itself. Cal. Code Regs. tit. 23, §§ 2550.4(d), (e), and (f) and 2550.5 are not potential ARARs because the site is not a regulated unit and the proposed removal action does not include treatment, storage, or disposal on-site.

Table A2-2 (continued)

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
Establishes beneficial uses of ocean waters, numerical and narrative WQOs, effluent quality objectives including toxic material limitations, and discharge prohibitions.		California Ocean Plan, Water Quality Control Plan for Ocean Waters of California, SWRCB Res. 97-026 (Cal. Water Code § 13170.2)	Not an ARAR	Neither groundwater nor surface water is included in the scope of the EE/CA.
Requires analysis for each priority pollutant to determine if water-quality-based effluent limitation is required. Provides effluent limitation development methodology.	Discharges of toxic priority pollutants into inland surface waters, bays, or estuaries.	Policy for Implementation of Toxic Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (Inland Surface Waters Plan) (SWRCB 2000), §§ 1.3 and 1.4	Not an ARAR	Discharges into inland surface waters, enclosed bays, or estuaries are not included in the scope of this EE/CA.
Definitions of designated waste, nonhazardous waste, and inert waste.		Cal. Code Regs. tit. 27, §§ 20210, 20220, and 20230	Not an ARAR	Potential ARARs for classifying waste and determining ARAR status of other requirements. The waste characterization requirements described in this section are not potential ARARs because the waste is assumed to be similar to RCRA hazardous waste and will be handled on-site under the identified RCRA ARARs.
California ambient air quality standards set legal limits on the level of an air pollutant in the outdoor (ambient) air necessary to protect public health.	Lead emissions of 1.5 $\mu g/m^3$ (30-day average)	Cal. Code Regs. tit. 17, §§ 70200	Not an ARAR	Not enforceable and, therefore, not a potential ARAR.

Table A2-2 (continued)

Notes:

[a] many potential action-specific ARARs contain chemical-specific limitations and are addressed in the action-specific ARAR tables

[b] only the substantive provisions of the requirements cited in this table are potential ARARs

[c] statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the DON accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only pertinent substantive requirements of specific citations are considered potential ARARs

Acronyms/Abbreviations:

ARAR – applicable or relevant and appropriate requirement
Cal. Code Regs. – *California Code of Regulations*
Cal-EPA – California Environmental Protection Agency
Cal. Water Code – *California Water Code*
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
div. – division
DON – Department of the Navy
EE/CA – engineering evaluation/cost analysis
gpd – gallons per day
IR – Installation Restoration (Program)
$\mu g/m^3$ – micrograms per cubic meter
MCL – maximum contaminant level
NPDES – National Pollutant Discharge Elimination System
ppm – parts per million
RCRA – Resource Conservation and Recovery Act
Res. – resolution
RWQCB – (California) Regional Water Quality Control Board, Santa Ana Region
§ – section
SWRCB – (California) State Water Resources Control Board
tit. – title
WQO – water quality objective

Table A3-1
Potential Federal Location-Specific ARARs

Location	Requirement	Prerequisite	Citation[a]	ARAR Determination	Comments
National Historic Preservation Act of 1966, as Amended (16 U.S.C. § 470–470x-6)[b]					
Historic project owned or controlled by federal agency	Action to preserve historic properties; planning of action to minimize harm to properties listed on or eligible for listing on the National Register of Historic Places.	Property included in or eligible for the National Register of Historic Places.	16 U.S.C. § 470–470x-6 36 C.F.R. pt. 800 40 C.F.R. § 6.301(b)	Not an ARAR	Substantive provisions are not applicable because IR Site 42 does not fall within a known archaeological site.
Archaeological and Historic Preservation Act (16 U.S.C. § 469–469c-1)[b]					
Within area where action may cause irreparable harm, loss, or destruction of significant artifacts	Construction on previously undisturbed land would require an archeological survey of the area. Data recovery and preservation would be required if significant archeological or historical data were found on-site. The responsible official or Secretary of the Interior is authorized to undertake data recovery and preservation.	Regulated alteration of terrain caused as a result of a federal construction project or federally licensed activity or program where action may cause irreparable harm, loss, or destruction of significant artifacts.	16 U.S.C. § 469–469c-1 40 C.F.R. § 6.301(c)	Not an ARAR	Substantive provisions are not applicable because IR Site 42 does not fall within a known archaeological site.
Historic Sites, Buildings, and Antiquities Act of 1935 (16 U.S.C. §§ 461–467)[b]					
Historic sites	Avoid undesirable impacts on landmarks.	Areas designated as historic sites.	16 U.S.C. §§ 461–467 40 C.F.R. § 6.301(a)	Not an ARAR	These requirements are not substantive and are not potential ARARs. IR Site 42 does not fall within a known archaeological site.

Table A3-1 (continued)

Location	Requirement	Prerequisite	Citation[a]	ARAR Determination	Comments
Archaeological Resources Protection Act of 1979, as Amended (16 U.S.C. § 470aa–470mm)[b]					
Archeological resources on federal land	Prohibits unauthorized excavation, removal, damage, alteration, or defacement of archeological resources located on public lands unless such action is conducted pursuant to a permit.	Archeological resources on federal land.	Pub. L. No. 96-95 16 U.S.C. § 470aa–470mm	Not an ARAR	Substantive provisions are not applicable because IR Site 42 does not fall within a known archaeological site.
Exec. Order No. 11990, Protection of Wetlands[b]					
Wetland	Action to minimize the destruction, loss, or degradation of wetlands.	Wetland meeting definition of Section 7.	40 C.F.R. § 6.302(a)	Applicable	The area of concern at IR Site 42 is located within the NWR wetland area. The substantive provisions of these requirements are potentially applicable to the proposed removal action.
Exec. Order No. 11988, Floodplain Management[b]					
Within floodplain	Actions taken should avoid adverse effects, minimize potential harm, restore and preserve natural and beneficial values.	Action that will occur in a floodplain (i.e., lowlands) and relatively flat areas adjoining inland and coastal waters and other flood-prone areas.	40 C.F.R. § 6.302(b) 40 C.F.R. pt. 6, app. A	Applicable	The area of concern at IR Site 42 is located in a low-lying, relatively flat area. Flooding brought about by a 100-year or a 500-year occurrence would potentially impact low-lying areas of Seal Beach. The substantive provisions of these requirements are potentially applicable to the proposed removal action.
Clean Water Act of 1977, as Amended, Section 404 (33 U.S.C. § 1344)[b]					
Wetland	Action to prohibit discharge of dredged or fill material into wetland without permit.	Wetland as defined by Exec. Order No. 11990 Section 7.	33 U.S.C. § 1344	Not an ARAR	The IR Site 42 removal action alternative will not include the discharge of dredged or fill material to a wetland.

Table A3-1 (continued)

Location	Requirement	Prerequisite	Citation[a]	ARAR Determination	Comments
Resource Conservation and Recovery Act (33 U.S.C. §§ 6901–6991[i])[b]					
Within 100-year floodplain	Facility must be designed, constructed, operated, and maintained to avoid washout.	RCRA hazardous waste; treatment, storage, or disposal of hazardous waste.	Cal. Code Regs. tit. 22, § 66264.18(b)	Not an ARAR	IR Site 42 is not a TSD facility located within a 100-year floodplain.
Wild and Scenic Rivers Act (16 U.S.C. §§ 1271–1287)[b]					
Within area affecting national wild, scenic, or recreational river	Avoid taking or assisting in action that will have direct adverse effect on scenic river.	Activities that affect or may affect any of the rivers specified in 16 U.S.C. §1276(a).	16 U.S.C. §§ 1271–1287	Not an ARAR	The IR Site 42 removal action alternative will not impact wild, scenic, or recreational rivers.
Fish and Wildlife Coordination Act (16 U.S.C. §§ 661–666c)[b]					
Area affecting stream or other water body	Action taken should protect fish or wildlife.	Diversion, channeling, or other activity that modifies a stream or other water body and affects fish or wildlife.	16 U.S.C. § 662	Not an ARAR	The IR Site 42 removal action alternative does not include modification of a stream or other water body and affect fish or wildlife.
Rivers and Harbors Act of 1899 (33 U.S.C. §§ 401–413)[b]					
Navigable waters	Permits required for structures or work in or affecting navigable waters.	Activities affecting navigable waters.	33 U.S.C. § 403 33 C.F.R. § 322	Not an ARAR	The IR Site 42 removal action alternative will not include activities, such as dredging, that could affect navigable waters.

Table A3-1 (continued)

Location	Requirement	Prerequisite	Citation[a]	ARAR Determination	Comments
Endangered Species Act of 1973 (16 U.S.C. §§ 1531–1543)[b]					
Habitat upon which endangered species or threatened species depend	Federal agencies may not jeopardize the continued existence of any listed species or cause the destruction or adverse modification of critical habitat. The Endangered Species Committee may grant an exemption for agency action if reasonable mitigation and enhancement measures such as propagation, transplantation, and habitat acquisition and improvement are implemented.	Determination of effect upon endangered or threatened species or its habitat. Critical habitat upon which endangered species or threatened species depend.	16 U.S.C. § 1536(a), (h)(1)(B)	Relevant and appropriate	Several bird species listed as endangered by either federal or state agencies are known to inhabit NAVWPNSTA Seal Beach, the NWR, and its associated wetlands. The proposed removal action is expected to mitigate potential threats to endangered species, although some temporary modification of the habitat may be required. Substantive requirements have been identified as potentially relevant and appropriate.
Migratory Bird Treaty Act of 1972 (16 U.S.C. §§ 703–712)[b]					
Migratory bird area	Protects almost all species of native migratory birds in the United States from unregulated "take," which can include poisoning at hazardous waste sites.	Presence of migratory birds.	16 U.S.C. § 703	Relevant and appropriate	Migratory birds have been observed at NAVWPNSTA Seal Beach, but the proposed removal action is not expected to impact migratory birds; however, substantive requirements may be potentially relevant and appropriate to the proposed removal action for the site.
Marine Mammal Protection Act (16 U.S.C. §§ 1361–1421h)[b]					
Marine mammal area	Protects any marine mammal in the United States except as provided by international treaties from unregulated "take."	Presence of marine mammals.	16 U.S.C. § 1372(a)(2)	Not an ARAR	IR Site 42 is located inland without direct connection to the ocean; therefore, marine mammals are not present.

Table A3-1 (continued)

Location	Requirement	Prerequisite	Citation[a]	ARAR Determination	Comments
Magnuson-Stevens Fishery Conservation and Management Act of 1976, as Amended (16 U.S.C. §§ 1801–1882)[b]					
Fishery under management	Provides for conservation and management of specified fisheries within specified fishery conservation zones.	Presence of managed fisheries.	16 U.S.C. §§ 1801–1882	Not an ARAR	A managed fishery does not exist at or near IR Site 42.
National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. § 668dd–668ee)[b]					
Wildlife refuge	No person shall take any animal or plant on any national wildlife refuge, except as authorized under 50 C.F.R. § 27.51. The disposing or dumping of wastes is prohibited.	Area designated as part of National Wildlife Refuge System.	16 U.S.C § 668dd–668ee Substantive provisions of 50 C.F.R. § 27.11–27.97	Applicable	The removal action at IR Site 42 could potentially impact breeding of several bird species that nest in the area. The species' breeding seasons are from March through September at NAVWPNSTA Seal Beach. Timing the removal action to coincide with nonbreeding periods would eliminate the potential for harming these endangered species. Substantive requirements of this act have been identified as potentially applicable.
Wilderness Act (16 U.S.C. §§ 1131–1136)[b]					
Wilderness area	Area must be administered in such a manner as will leave it unimpaired as wilderness and preserve its wilderness character.	Federally owned area designated as wilderness area.	16 U.S.C. §§ 1131–1136 50 C.F.R. §§ 35.1–35.14	Not an ARAR	The area to be affected by the removal action alternative is not a federally owned wilderness area.

Table A3-1 (continued)

Location	Requirement	Prerequisite	Citation[a]	ARAR Determination	Comments
Resource Conservation and Recovery Act (42 U.S.C. §§ 6901–6991[i])[b]					
New treatment, storage, or disposal of hazardous waste prohibited.	RCRA hazardous waste; treatment, storage, or disposal of hazardous waste.	RCRA hazardous waste; treatment, storage, or disposal of hazardous waste.	Cal. Code Regs. tit. 22, § 66264.18(a)	Not an ARAR	IR Site 42 is not a TSD facility near a Holocene fault.
Placement of noncontainerized or bulk liquid hazardous waste prohibited.	RCRA hazardous waste; placement.	RCRA hazardous waste; placement.	Cal. Code Regs. tit. 22, § 66264.18(c)	Not an ARAR	IR Site 42 is not near a salt formation, mine, or cave.

Notes:

[a] only the substantive provisions of the requirements cited in this table are potential ARARs

[b] statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the DON accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only substantive requirements of the specific citations are considered potential ARARs

Acronyms/Abbreviations:

app. – appendix
ARAR – applicable or relevant and appropriate requirement
Cal. Code Regs. – *California Code of Regulations*
C.F.R. – *Code of Federal Regulations*
DON – Department of the Navy
Exec. Order No. – executive order number
IR – Installation Restoration (Program)
pt. – part
Pub. L. No. – public law number
RCRA – Resource Conservation and Recovery Act
§ – section
tit. – title
U.S.C. – *United States Code*

Table A3-2
Potential State Location-Specific ARARs

Location	Requirement	Prerequisite	Citation[a]	ARAR Determination	Comments
California Endangered Species Act (Cal. Fish & Game Code §§ 2050–2116)[b]					
Endangered species habitat	Department policy and legislative findings and definitions for significant natural areas.	Activity taking place in an endangered species habitat and significant natural area.	Cal. Fish & Game Code §§ 2050–2068	Not an ARAR	Procedural; not a "cleanup standard, standard of control," or "other substantive requirement, criteria, or limitation."
Endangered species habitat	Procedures for listing endangered species.	Threatened or endangered species determination.	Cal. Fish & Game Code § 2070	Not an ARAR	Procedural; not a "cleanup standard, standard of control," or "other substantive requirement, criteria, or limitation."
Endangered species habitat	No person shall import, export, take, possess, or sell any endangered or threatened species or part or product thereof.	Threatened or endangered species determination on or before 01 January 1985 or a candidate species with proper notification.	Cal. Fish & Game Code § 2080	Relevant and applicable	Several bird species listed as endangered by either federal or state agencies are known to inhabit NAVWPNSTA Seal Beach, the NWR, and its associated wetlands. The proposed removal action is expected to mitigate potential threats to endangered species, although some temporary modification of the habitat may be required. There are no known reported sightings of these species at the site designated for the removal action therefore the requirements have been identified as potentially relevant and applicable.

Table A3-2 (continued)

Location	Requirement	Prerequisite	Citation[a]	ARAR Determination	Comments
California Coastal Act of 1976[b]					
Endangered species habitat	Ensures that action taken will not jeopardize the survival and reproduction of any threatened or endangered species.	Threatened or endangered species determination or a candidate species with proper notification.	Cal. Fish & Game Code §§ 2090–2096	Not an ARAR	Not effective after 01 January 1994.
Coast	Regulates activities associated with development to control direct significant impacts on coastal waters and to protect state and national interests in California coastal resources.	Any activity which could impact coastal waters and resources.	Cal. Pub. Res. Code §§ 30000–30900; Cal. Code Regs. tit. 14, §§ 13001–13666.4	Not an ARAR	The IR Site 42 removal action alternative will not affect a coastal zone.

Notes:

[a] only the substantive provisions of the requirements cited in this table are potential ARARs

[b] statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the DON accepts the entire statutes or policies as potential ARARs; specific potential ARARs follow each general heading; only substantive requirements of the specific citations are considered potential ARARs

Acronyms/Abbreviations:

ARAR – applicable or relevant and appropriate requirement
Cal. Code Regs. – *California Code of Regulations*
Cal. Fish & Game Code – *California Fish and Game Code*
Cal. Pub. Res. Code – *California Public Resources Code*
CCC – California Coastal Commission
DON – Department of the Navy
§ – section

Table A4-1
Potential Federal Action-Specific ARARs

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal

Action	Requirement	Prerequisites	Citation	ARAR Determination A	RA	TBC	Comments
Resource Conservation and Recovery Act (42 U.S.C. §§ 6901–6991[i])[b]							
On-site waste generation	Person who generates waste shall determine if that waste is a hazardous waste.	Generator of waste.	Cal. Code Regs. tit. 22, § 66262.10(a), 66262.11	2,3			Applicable for any operation where hazardous waste is generated. There is a potential for excavated soils to be classified as RCRA hazardous waste due to localized concentrations of metals. The determination of whether wastes generated during removal activities are hazardous will be made at the time the wastes are generated.
	Requirements for analyzing waste for determining whether waste is hazardous.	Generator of waste.	Cal. Code Regs. tit. 22, § 66264.13(a) and (b)	2,3			Applicable for any operation where hazardous waste is generated. There is a potential for excavated soils to be classified as RCRA hazardous waste due to localized concentrations of metals. The determination of whether wastes generated during removal activities are hazardous will be made at the time the wastes are generated.

Table A4-1 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Hazardous waste accumulation	On-site hazardous waste accumulation is allowed for up to 90 days as long as the waste is stored in containers in accordance with § 66262.171–178 or in tanks, on drip pads, inside buildings, is labeled and dated, etc.	Accumulate hazardous waste.	Cal. Code Regs. tit. 22, § 66262.34	2,3			Applicable for any operation where hazardous waste is generated. The determination of whether wastes generated during removal action activities are hazardous will be made at the time the wastes are generated.
Site closure	Minimize the need for further maintenance controls and minimize or eliminate, to the extent necessary to protect human health and the environment, postclosure escape of hazardous waste, hazardous constituents, leachate, contaminated rainfall or runoff, or waste decomposition products to groundwater or surface water or to the atmosphere.	Hazardous waste management facility.	Cal. Code Regs. tit. 22, § 66264.111(a) and (b)				Not an ARAR. No land-based disposal units are planned for waste management.

Table A4-1 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Clean closure	During the partial and final closure periods, all contaminated equipment, structures and soils shall be properly disposed or decontaminated by removing all hazardous waste and residues.	Hazardous waste management facility.	Cal. Code Regs. tit. 22, § 66264.114				Not an ARAR. The proposed removal action does not include clean closure of a hazardous waste management facility.
Container storage	Containers of RCRA hazardous waste must be: • maintained in good condition, • compatible with hazardous waste to be stored, and • closed during storage except to add or remove waste.	Storage of RCRA hazardous waste not meeting small-quantity generator criteria held for a temporary period greater than 90 days before treatment, disposal, or storage elsewhere, in a container.	Cal. Code Regs. tit. 22, § 66264.171, .172, .173				Not an ARAR. No container storage is proposed for the removal action.
	Inspect container storage areas weekly for deterioration.		Cal. Code Regs. tit. 22, § 66264.174				Not an ARAR. Container storage is not proposed.

Table A4-1 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Container storage (continued)	Place containers on a sloped, crack-free base, and protect from contact with accumulated liquid. Provide containment system with a capacity of 10 percent of the volume of containers of free liquids. Remove spilled or leaked waste in a timely manner to prevent overflow of the containment system.	Storage in a container of RCRA hazardous waste not meeting small-quantity generator criteria before treatment, disposal, or storage elsewhere.	Cal. Code Regs. tit. 22, § 66264.175(a) and (b)				Not an ARAR. The DON does not plan to store hazardous wastes in containers.
	Keep containers of ignitable or reactive waste at least 50 feet from the facility property line.	Ignitable or reactive waste.	Cal. Code Regs. tit. 22, § 66264.176				Not an ARAR. The DON does not plan to store hazardous wastes in containers.
	Keep incompatible materials separate. Separate incompatible materials stored near each other by a dike or other barrier.		Cal. Code Regs. tit. 22, § 66264.177				Not an ARAR. The DON does not plan to store hazardous wastes in containers.
	At closure, remove all hazardous waste and residues from the containment system, and decontaminate or remove all containers and liners.		Cal. Code Regs. tit. 22, § 66264.178				Not an ARAR. The DON does not plan to store hazardous wastes in containers.
Placement of waste in land disposal units	Movement of excavated materials to new location and placement in or on land will trigger LDRs for the excavated waste or closure requirements for the unit in which the waste is being placed.	Materials containing RCRA hazardous wastes subject to LDRs are placed in another unit.	Cal. Code Regs. tit. 22, § 66268.40				Not an ARAR. Disposal or placement of waste on land is not included as part of the proposed removal alternative. Soil excavated during proposed removal activities will be removed for off-site disposal.

Table A4-1 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
	Treatment of waste subject to ban on land disposal must attain levels achievable by BDAT for each hazardous constituent in each listed waste, if residual is to be land disposed.	Placement of RCRA hazardous waste in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, or underground mine or cave.	Cal. Code Regs. tit. 22, § 66268.42				Not an ARAR. Disposal or placement of waste on land is not included as part of the proposed removal alternative. Soil excavated during proposed removal activities will be removed for off-site disposal.
	BDAT standards for spent solvent wastes and dioxin-containing wastes are based on one of four technologies or combinations: for wastewaters, (1) steam stripping, (2) biological treatment, or (3) carbon absorption; and for all other wastes, (4) incineration. Any technology may be used, however, if it will achieve the concentration levels specified.	Solvent or dioxin-containing wastes.	Cal. Code Regs. tit. 22, § 66268.30, § 66268.31				Not an ARAR. Neither solvent- nor dioxin-containing wastes have been identified at the site.

Table A4-1 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Clean closure	Remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste. If waste is left on-site, closure and postclosure care requirements are necessary.	Surface impoundments, container or tank liners, and hazardous waste residues or contaminated soil (including soil from dredging or soil disturbed in the course of drilling or excavation) returned to land. Not applicable to material treated, stored, or disposed only before the effective date of the requirements, or if treated *in situ* or consolidated within the area of contamination.	Cal. Code Regs. tit. 22, § 66264.228(a), (b), (e)–(k), (m), (o)–(q) except as it cross-references procedural requirements such as closure plans and annual reports				Not an ARAR. No land-based disposal units are planned for waste management.

Table A4-1 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Waste pile	Use a single liner and leachate collection system. Waste put into waste pile is subject to land ban regulations.	RCRA hazardous waste, noncontainerized accumulation of solid, nonflammable hazardous waste that is used for treatment or storage.	Cal. Code Regs. tit. 22, § 66264.251 (except 251[j], 251[e][11])				Not an ARAR. Wastes are not planned to be managed as waste piles as part of this action.
	Alternative requirements that are protective of human health or the environment may replace design, operating, or closure standards for temporary tanks and container storage areas.		Cal. Code Regs. tit. 22, § 66264.553(b) and (d)				Not an ARAR. The use of temporary units is not anticipated during implementation of the proposed removal alternative.
	Allows generators to accumulate solid remediation waste in a U.S. EPA-designated pile for storage only, up to 2 years, during remedial operations without triggering LDRs.	Hazardous remediation waste temporarily stored in piles.	40 C.F.R. § 264.554(d)(1)(i–ii) and (d)(2), (e), (f), (h), (i), (j), and (k)				Not an ARAR. The use of designated storage piles are not anticipated during implementation of the proposed removal alternative.

Table A4-1 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Waste pile (continued)	Prevent run-on and control and collect runoff from a 24-hour 25-year storm (waste piles, land treatment facilities, landfills). Prevent overtopping of surface impoundments.	RCRA hazardous waste treated, stored, or disposed after the effective date of the requirements.	Cal. Code Regs. tit. 22, § 66264.221(c), (e), (h); § 66264.251(c), (d), (f), (g), (h), (k); § 66264.273(c), (d), (j)(1); § 66264.301(c), (d), (f), (g)				Not an ARAR. The storage, treatment, or disposal of RCRA hazardous waste in piles, landfills, and surface impoundments is not included in the proposed removal alternative for IR Site 42.
Closure of waste pile	At closure, owner shall remove or decontaminate all waste residues, contaminated containment system components, contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste. If waste is left on-site, perform postclosure care in accordance with the closure and postclosure care requirements that apply to landfills.	Waste pile used to store hazardous waste.	Cal. Code Regs. tit. 22, § 66264.258(a) and (b) except references to procedural requirements				Not an ARAR. Waste piles will not be used to store hazardous waste.

Table A4-1 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
CAMU	An area at a RCRA facility may be designated as a CAMU. Placement of remediation wastes into or within a CAMU does not constitute land disposal of hazardous wastes nor creation of a unit subject to minimum technology requirements or LDRs.	RCRA CAMU.	Cal. Code Regs. tit. 22, § 66264.552(c) and (e)				Not an ARAR. Removal actions will not involve creation of a CAMU.
Monitoring	Owners/operators of RCRA surface impoundment, waste pile, land treatment unit, or landfill shall conduct a monitoring and response program for each regulated unit.	Surface impoundment, waste pile, land treatment unit, or landfill for which constituents in or derived from waste in the unit may pose a threat to human health or the environment.	Cal. Code Regs. tit. 22, § 66264.91(a) and (c), except as it cross-references permit requirements				Not an ARAR. RCRA surface impoundments, waste piles, land treatment units, or landfills are not pertinent to the scope of the proposed removal alternative for IR Site 42. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.
POC	The POC is a vertical surface, located at the hydraulically downgradient limit of the waste management area that extends through the uppermost aquifer underlying the regulated unit.	Hazardous waste treatment, storage, or disposal facility.	Cal. Code Regs. tit. 22, § 66264.95				Not an ARAR. Groundwater is not included in the scope of the proposed removal alternative for IR Site 42.

Table A4-1 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Monitoring	Requirements for monitoring groundwater, surface water, and the vadose zone.	Hazardous waste treatment, storage, or disposal facility.	Cal. Code Regs. tit. 22, § 66264.97				Not an ARAR. There is no regulated unit and no treatment, storage, or disposal proposed. Groundwater and surface water are not included in the scope of the proposed removal alternative for IR Site 42.
	Requirements for a detection monitoring program.	Hazardous waste treatment, storage, or disposal facility.	Cal. Code Regs. tit. 22, § 66264.98				Not an ARAR. There is no regulated unit and no treatment, storage, or disposal proposed. Groundwater and surface water are not included in the scope of the proposed removal alternative for IR Site 42.
	Requirements for an evaluation monitoring program.	Hazardous waste treatment, storage, or disposal facility.	Cal. Code Regs. tit. 22, § 66264.99				Not an ARAR. There is no regulated unit and no treatment, storage, or disposal proposed. Groundwater and surface water are not included in the scope of the proposed removal alternative for IR Site 42. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.

Table A4-1 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Corrective action	The owner or operator required to take corrective action under Cal. Code Regs. tit. 22, § 66264.91 shall take corrective action to remediate releases from the regulated unit and to ensure that the regulated unit achieves compliance with the water quality protection standard.	Hazardous waste treatment, storage, or disposal facility.	Cal. Code Regs. tit. 22, § 66264.100(a) and (b)				Not an ARAR. Corrective action is not pertinent to the scope of the proposed removal alternative for IR Site 42. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.
	The owner or operator shall implement corrective action measures that ensure that constituents of concern achieve their respective concentration limits at all monitoring points and throughout the zone affected by the release, including any portions of the affected zone that extend beyond the facility boundary, by removing the waste constituents or treating them in place. The owner or operator shall take other action to prevent noncompliance due to a continued or subsequent release including, but not limited to, source control.	Hazardous waste treatment, storage, or disposal facility.	Cal. Code Regs. tit. 22, § 66264.100(c)				Not an ARAR. Corrective action is not pertinent to the scope of the proposed removal alternative for IR Site 42. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.

Table A4-1 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Monitoring	The owner or operator shall establish and implement, in conjunction with the corrective action measures, a water quality monitoring program that will demonstrate the effectiveness of the corrective action program and be effective in determining compliance with the water quality protection standard and in determining the success of the corrective action measures under subsection (c) of this section.	Hazardous waste treatment, storage, or disposal facility.	Cal. Code Regs. tit. 22, § 66264.100(d)				Not an ARAR. Corrective action is not pertinent to the scope of the proposed removal alternative for IR Site 42. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.
Completion of response action	Completion of the corrective action program must be demonstrated to be in compliance with the water quality protection standard based on the results of sampling and analysis for all constituents of concern for a period of 1 year and establish a detection monitoring program.	Hazardous waste treatment, storage, or disposal facility.	Cal. Code Regs. tit. 22, § 66264.100(g)(1) and (3)				Not an ARAR. Corrective action is not pertinent to the scope of the proposed removal alternative for IR Site 42. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.

Table A4-1 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Clean Air Act (42 U.S.C. §§ 7401–7671)[b]							
Discharge to air	NAAQS – primary and secondary standards for ambient air quality to protect public health and welfare (including standards for particulate matter and lead).	Contamination of air affecting public health and welfare.	40 C.F.R. § 50.4–50.12				Not an ARAR. Federal NAAQS are nonenforceable standards.
Discharge of any nonattainment air contaminant or any halogenated hydrocarbons	All new sources of air pollution that may result in a net emission increase of any nonattainment air contaminant or any halogenated hydrocarbons are to employ BACT.	Net emissions increase of any nonattainment air contaminant or any halogenated hydrocarbons.	SCAQMD Rule 1303				Not an ARAR. The air strippers are not proposed as the part of the proposed removal alternative at IR Site 42.

Table A4-1 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Federal Hazardous Materials Transportation Law (49 U.S.C. §§ 5101–5127)[b]							
Transportation of hazardous material	No person shall represent that a container or package is safe unless it meets the requirements of 49 U.S.C. §§ 5101–5127.	Interstate carriers transporting hazardous waste and substances by motor vehicle. Transportation of hazardous material under contract with any department of the executive branch of the federal government.	49 C.F.R. § 171.2(f)				Not an ARAR. Under CERCLA, ARARs evaluation is made for proposed on-site activities. On-site transportation of hazardous materials is not part of the proposed removal alternative.
	No person shall unlawfully alter or deface labels, placards or descriptions, packages, containers, or motor vehicles used for transportation of hazardous materials.		49 C.F.R. § 171.2(g)				Not an ARAR. Under CERCLA, ARARs evaluation is made for proposed on-site activities. On-site transportation of hazardous materials is not part of the proposed removal alternative.
Hazardous materials marking, labeling, and placarding	Each person who offers hazardous material for transportation or each carrier that transports it shall mark each package, container, and vehicle in the manner required.	Person who offers hazardous material for transportation; carries hazardous material; or packages, labels, or placards hazardous material.	49 C.F.R. § 172.300				Not an ARAR. Under CERCLA, ARARs evaluation is made for proposed on-site activities. On-site transportation of hazardous materials is not part of the proposed removal alternative.

Table A4-1 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Hazardous materials marking, labeling, and placarding (continued)	Each person offering nonbulk hazardous materials for transportation shall mark the proper shipping name and identification number (technical name) and consignee's name and address.		49 C.F.R. § 172.301				Not an ARAR. Under CERCLA, ARARs evaluation is made for proposed on-site activities. On-site transportation of hazardous materials is not part of the proposed removal alternative.
	Hazardous materials for transportation in bulk packages must be labeled with proper ID number, specified in 49 C.F.R. § 172.101 table, with required size of print. Packages must remain marked until cleaned or refilled with material requiring other marking.		49 C.F.R. § 172.302				Not an ARAR. Under CERCLA, ARARs evaluation is made for proposed on-site activities. On-site transportation of hazardous materials is not part of the proposed removal alternative.
	No package marked with a proper shipping name or ID number may be offered for transport or transported unless the package contains the identified hazardous material or its residue.		49 C.F.R. § 172.303				Not an ARAR. Under CERCLA, ARARs evaluation is made for proposed on-site activities. On-site transportation of hazardous materials is not part of the proposed removal alternative.

Table A4-1 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Hazardous materials marking, labeling, and placarding (continued)	The markings must be durable, in English, in contrasting colors, unobscured, and away from other markings.		49 C.F.R. § 172.304				Not an ARAR. Under CERCLA, ARARs evaluation is made for proposed on-site activities. On-site transportation of hazardous materials is not part of the proposed removal alternative.
	Nonbulk combination packages containing liquid hazardous materials must be packed with closures upward, and marked with arrows pointing upward.		49 C.F.R. § 172.312				Not an ARAR. Under CERCLA, ARARs evaluation is made for proposed on-site activities. On-site transportation of hazardous materials is not part of the proposed removal alternative.
	Labeling of hazardous material packages shall be as specified in the list.		49 C.F.R. § 172.400				Not an ARAR. Under CERCLA, ARARs evaluation is made for proposed on-site activities. On-site transportation of hazardous materials is not part of the proposed removal alternative.
	Each bulk packaging or transport vehicle containing any quantity of hazardous material must be placarded on each side and each end with the type of placards listed in Tables 1 and 2 of 49 C.F.R. § 172.504.	Each person who offers for transport or transports any hazardous materials shall comply with these placarding requirements.	49 C.F.R. § 172.504				Not an ARAR. Under CERCLA, ARARs evaluation is made for proposed on-site activities. On-site transportation of hazardous materials is not part of the proposed removal alternative.

Table A4-1 (continued)

Notes:

[a] discussion of compliance with action-specific ARARs is not appropriate

[b] statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader. Listing the statutes and policies does not indicate that the DON accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only substantive requirements of specific citations are considered potential ARARs

Acronyms/Abbreviations:

A – applicable
ARAR – applicable or relevant and appropriate requirement
BDAT – best demonstrated available technology
Cal. Code Regs. – *California Code of Regulations*
CAMU – corrective action management unit
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R. – *Code of Federal Regulations*
DON – Department of the Navy
EE/CA – engineering evaluation/cost analysis
IR – Installation Restoration (Program)
LDR – land disposal restriction
NAAQS – National Ambient Air Quality Standards (primary and secondary)
PM_{10} – particulate matter, less than 10 micrometers in diameter
POC – point of compliance
RA – relevant and appropriate
RCRA – Resource Conservation and Recovery Act
§ – section
SCAQMD – South Coast Air Quality Management District
TBC – to be considered
tit. – title
U.S.C. – *United States Code*

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Table A4-2
Potential State Action-Specific ARARs

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal

Action	Requirement	Prerequisites	Citation	ARAR Determination A	ARAR Determination RA	ARAR Determination TBC	Comments
State Water Resources Control Board and Regional Water Quality Control Board[b]							
Actions affecting water quality	Authorizes the SWRCB and RWQCB to establish in water quality control plans beneficial uses and numerical and narrative standards to protect both surface water and groundwater quality. Authorizes regional water boards to issue permits for discharges to land or surface water or groundwater that could affect water quality, including NPDES permits, and to take enforcement action to protect water quality.		Cal. Water Code, div. 7, §§ 13241, 13243, 13263(a), 13269, and 13360 (Porter-Cologne Water Quality Control Act); other provisions are not ARARs				Not an ARAR. Groundwater is not part of the scope for the proposed removal action at IR Site 42. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.
	Describes the water basins in the Santa Ana Region, establishes beneficial uses of surface water and groundwater, establishes water quality objectives, including narrative and numerical standards, establishes implementation plans to meet water quality objectives and protect beneficial uses, and incorporates statewide water quality control plans and policies.		Comprehensive Water Quality Control Plan for the Santa Ana Region				Not an ARAR. Groundwater is not part of the scope for the proposed removal action at IR Site 42. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.

Table A4-2 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Discharges to high-quality waters	Incorporated into all Regional Board Basin Plans. Requires that quality of waters of the state that is better than needed to protect all beneficial uses be maintained unless certain findings are made. Discharges to high quality waters must be treated using best practicable treatment or control necessary to prevent pollution or nuisance and to maintain the highest quality water. Requires cleanup to background water quality or to lowest concentrations technically and economically feasible to achieve. Beneficial uses must, at least, be protected.		SWRCB Res. 68-16 (Policy With Respect to Maintaining High Quality of Waters in California) (Cal. Water Code § 13140, CWA regulations 40 C.F.R. § 131.12)				Not an ARAR. SWRCB Res. No. 68-16 is a potential ARAR for new discharges, not for cleanup or migration of groundwater. Groundwater is not part of the scope for the proposed removal action at IR Site 42. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.
Actions affecting water quality	Provides water quality criteria for classifying the beneficial use of groundwater as municipal/domestic. Criteria outlined as follows: total dissolved solids ≤ 3,000 mg/L or yielding 200 gallons per day or serving as a public water system.	Applies in determining beneficial uses for waters that may be affected by discharges of waste.	SWRCB Res. 88-63 ("Sources of Drinking Water Policy") (as contained in the Basin Plans)				Not an ARAR. Groundwater is not part of the scope for the proposed removal action at IR Site 42.

Table A4-2 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal

Action	Requirement	Prerequisites	Citation	ARAR Determination			Comments
				A	RA	TBC	
Actions affecting water quality (continued)	Establishes policies and procedures for the oversight of investigations and cleanup and abatement activities resulting from discharges of waste which affect or threaten water quality. Requires cleanup of all waste discharged and restoration of affected water to background conditions. Requires actions for cleanup and abatement to conform to Res. 68-16 and applicable provisions of Cal. Code Regs. tit. 23, div. 3, ch. 15 as feasible.	Cleanup and discharge of groundwater to groundwater or surface water and establishment of containment zones.	SWRCB Res. 92-49 (Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Cal. Water Code § 13304) (Cal. Water Code § 13307) (02 October 1996)				Not an ARAR. Groundwater is not part of the scope for the proposed removal action at IR Site 42. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.
Discharge to ocean	Describes policy for protection of ocean water quality. Includes beneficial use designations, water quality objectives, general requirements, compliance criteria, and discharge prohibitions. All discharges to the ocean must comply with criteria set forth in the Ocean Plan.	Plan is applicable to point source discharges to the ocean and nonpoint sources of waste discharge. Plan provides water quality objectives for receiving waters. Plan does not apply to discharges to enclosed bays and estuaries.	SWRCB Res. 97-026, California Ocean Plan (23 July 1997), policy set forth in Cal. Water Code, div. 7, §§ 13000, 13170, and 13170.2				Not an ARAR. There are no planned discharges to ocean waters as part of the proposed removal alternative for IR Site 42.

Table A4-2 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal

Action	Requirement	Prerequisites	Citation	ARAR Determination A	ARAR Determination RA	ARAR Determination TBC	Comments
Safe Drinking Water and Toxic Enforcement Act of 1986 (Prop. 65)[b]							
Discharge to drinking water source	Prohibits discharge of known human carcinogens or reproductive toxins to source of drinking water or on land where it could pass into a source of drinking water. Chemicals and applicable regulatory levels are listed in Cal. Code Regs. tit. 22, § 12000–14000.	Discharge of known human carcinogens or reproductive toxins.	Safe Drinking Water and Toxic Enforcement Act of 1986 (Prop. 65), Cal. Health & Safety Code, div. 20, § 25249.5–.13				Not an ARAR. This statute is expressly not directly applicable to the federal government. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.
California Environmental Quality Act[b]							
Actions by state	Requires analysis of environmental impacts of response actions, comparison of alternative actions, and implementation of appropriate mitigation measures. No hazardous substances may remain on-site unless further mitigation is not feasible.	State actions.	CEQA, California Pub. Res. Code §§ 21100–21178, 15000, and 15002				Not an ARAR. Requirements of CEQA are applicable to state actions and not those of the federal government. The CERCLA process fulfills these requirements (see Section A1.3.2).

Table A4-2 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal

Action	Requirement	Prerequisites	Citation	ARAR Determination A	ARAR Determination RA	ARAR Determination TBC	Comments
Toxic Pits Cleanup Act[b]							
Action at surface impoundment	Authorizes the RWQCB to regulate surface impoundments containing hazardous waste, as defined in Cal. Code Regs. tit. 22. Prohibits discharges to such surface impoundments unless they meet specified siting and design requirements. Requires compliance with specific investigation, remediation, and reporting requirements.	Surface impoundment.	Cal. Health & Safety Code § 25208 (Toxic Pits Cleanup Act)				Not an ARAR. There is no planned discharge to or cleanup of surface impoundment as part of the proposed removal alternative.
State Water Resources Control Board[b]							
Landfill capping	Alternatives to construction or prescriptive standards.	Cal. Code Regs. tit. 27 requirements are only applicable for waste discharged after 18 July 1997 unless otherwise noted.	Cal. Code Regs. tit. 27, §§ 20080 (b) and (c) and 21090				Not an ARAR. The proposed removal alternative does not include an alternative cap or cover.

Table A4-2 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Monitoring	Persons responsible for discharges at units that were CAI on or before 27 November 1984 may be required to develop and implement a monitoring program in accordance with subdiv. 1, subch. 3, art. 1 (Cal. Code Regs. tit 27, §§ 20380–20435).	CAI waste management unit before 27 November 1984.	Cal. Code Regs. tit. 27, § 20080(g)				Not an ARAR. IR Site 42 does not constitute a CAI waste management unit.
Disposal of waste	Requires that designated waste as defined at Cal. Water Code § 13173 be discharged to Class I or Class II waste management units.	Discharges of designated waste after 18 July 1997 (nonhazardous waste that could cause degradation of surface or ground waters) to land for treatment, storage, or disposal.	Cal. Code Regs. tit. 27, § 20210				Not an ARAR. Waste discharge is not a part of the proposed removal alternative.
	Requires that nonhazardous solid waste as defined at § 20220(a) be discharged to a classified waste management unit.	Discharge of nonhazardous solid waste after 18 July 1997 to land for treatment, storage, or disposal.	Cal. Code Regs. tit. 27, § 20220(b), (c), and (d)				Not an ARAR. Waste discharge is not a part of the proposed removal alternative.

Table A4-2 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Disposal of waste (continued)	Inert waste as defined at § 20230(a) need not be discharged at a classified unit.	Applies to discharges of inert waste to land after 18 July 1997 for treatment, storage, or disposal.	Cal. Code Regs. tit. 27, § 20230(b)				Not an ARAR. Waste discharge is not a part of the proposed removal alternative.
Monitoring	Requires detection monitoring. Once a significant release has occurred, evaluation or corrective action monitoring is required.	Discharge of waste to land after 18 July 1997.	Cal. Code Regs. tit. 27, § 20385(a)(1) and (a)(2)				Not an ARAR. Waste discharge is not a part of the proposed removal alternative. Treatment, storage, and disposal on-site are not proposed. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.
Groundwater cleanup	Requires identification of the point of compliance, hydraulically downgradient from the area where waste was discharged to land.	Discharge of waste to land after 18 July 1997.	Cal. Code Regs. tit. 27, § 20405				Not an ARAR. Groundwater is not part of the scope for the proposed removal action at IR Site 42. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.
Monitoring	Requires monitoring for compliance with removal action objectives for 3 years from the date of achieving cleanup levels.	Discharge of waste to land after 18 July 1997.	Cal. Code Regs. tit. 27, § 20410				Not an ARAR. Waste discharge is not a part of the proposed removal alternative.
	Requires general soil, surface water, and groundwater monitoring.	Discharge of waste to land after 18 July 1997.	Cal. Code Regs. tit. 27, § 20415				Not an ARAR. Waste discharge is not a part of the proposed removal alternative.

Table A4-2 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal

Action	Requirement	Prerequisites	Citation	ARAR Determination			Comments
				A	RA	TBC	
Groundwater monitoring	Provides minimum requirements for a groundwater detection monitoring program.	Discharge of waste to land after 18 July 1997.	Cal. Code Regs. tit. 27, § 20420				Not an ARAR. Waste discharge is not a part of the proposed removal alternative. No on-site treatment, storage, or disposal is proposed. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.
	Requires evaluation monitoring once a significant release is detected.	Discharge of waste to land after 18 July 1997.	Cal. Code Regs. tit. 27, § 20425				Not an ARAR. Waste discharge is not a part of the proposed removal alternative. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.
Corrective action	Requires implementation of corrective action measures that ensure that cleanup levels are achieved throughout the zone affected by the release by removing the waste constituents or treating them in place. Source control may be required. Also requires monitoring to determine the effectiveness of the corrective actions.	Discharge of waste to land after 18 July 1997.	Cal. Code Regs. tit. 27, § 20430 except § 20430(g)(2)				Not an ARAR. There is no indication that waste constituents have been released or that there is the potential for release to groundwater or surface water.

Table A4-2 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Clean closure	When the discharger has successfully completed clean closure, the landfill shall no longer be subject to the SWRCB-promulgated requirements of this title; otherwise, the discharger shall close the landfill and carry out postclosure maintenance as though the discharger had not attempted clean closure. For the purpose of this paragraph, the discharger shall have successfully clean-closed a landfill only if all waste materials, contaminated components of the containment system, and affected geologic materials — including soils and rock beneath and surrounding the unit and groundwater polluted by a release from the unit—are either removed and discharged to an appropriate unit or treated to the extent that they no longer pose a threat to water quality; and all remaining containment features are inspected for contamination and, if contaminated, discharged in accordance with para. (f)(1).		Cal. Code Regs. tit. 27, § 21090(f)				Not an ARAR. IR Site 42 is not a landfill. In addition, clean closure of a waste management unit is not a part of the proposed removal action.

Table A4-2 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal

Action	Requirement	Prerequisites	Citation	ARAR Determination			Comments
				A	RA	TBC	
Monitoring	Detection monitoring program may be required at CAI sites before the effective date of these requirements.	CAI site before 27 November 1984.	Cal. Code Regs. tit. 23, § 2510(g)				Not an ARAR. IR Site 42 was not CAI before 27 November 1984.
Detection monitoring	Detection monitoring program.	Cal. Code Regs. tit. 23 requirements are only applicable to waste discharges to land after 27 November 1984.	Cal. Code Regs. tit. 23, § 2550.8				Not an ARAR. IR Site 42 was not CAI before 27 November 1984.
Evaluation monitoring	Evaluation monitoring program.	Cal. Code Regs. tit. 23 requirements are only applicable to waste discharges to land after 27 November 1984.	Cal. Code Regs. tit. 23, § 2550.9				Not an ARAR. IR Site 42 was not CAI before 27 November 1984.
California Fish and Game Code[b]							
Actions involving wildlife	Designation of the Department of Fish and Game as trustee for State Fish and Wildlife Resources.		Cal. Fish & Game Code § 711.7				Not an ARAR. Not a "cleanup standard, standard of control," or "other substantive requirement, criteria, or limitation."

Table A4-2 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal

Action	Requirement	Prerequisites	Citation	ARAR Determination			Comments
				A	RA	TBC	
Rare native plants	Action must be taken to conserve native plants. Prohibits the releases and/or actions that would have a deleterious effect on species or habitat.	Rare native plants.	Cal. Fish & Game Code § 1900				Not an ARAR. Rare native plants have not been observed on or near IR Site 42.
Aquatic and wildlife species/habitat	Conservation objectives and policy for natural resources.		Cal. Fish & Game Code § 2014				Not an ARAR. This is not a "cleanup standard, standard of control," or "other substantive requirement, criteria, or limitation."
Actions impacting endangered species/habitat	Action must be taken to conserve endangered species. Prohibits releases that would have a deleterious effect on species.	Endangered or threatened species.	Cal. Fish & Game Code § 2080				Not an ARAR. Endangered species have not been observed on or near IR Site 42.
Actions impacting birds or mammals	Prohibits the taking of birds and mammals, including the taking by poison.	Birds and mammals.	Cal. Fish & Game Code § 3005(a)	2,3			Procedural aspects are not ARARs; certain substantive provisions pertaining to take of birds or mammals with a poisonous substance are potentially applicable. The removal activity will prevent "take" of birds and mammals by removing soil contaminants.
Actions impacting birds	Action must be taken to avoid the take or destruction of the nest or eggs of any bird.	Birds.	Cal. Fish & Game Code § 3503	2,3			The removal action at IR Site 42 may be conducted during breeding season therefore this provision is potentially applicable.

Table A4-2 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal

Action	Requirement	Prerequisites	Citation	ARAR Determination			Comments
				A	RA	TBC	
Actions impacting birds of prey	Action must be taken to prevent the take, possession, or destruction of any birds of prey or their eggs.	Birds of prey.	Cal. Fish & Game Code § 3503.5	2,3			Birds of prey have been observed throughout the area. This provision is potentially applicable.
Actions impacting fully protected bird species/ habitat	Action must be taken to prevent the taking of fully protected birds.	Fully protected bird species/habitat.	Cal. Fish & Game Code § 3511	2,3			The habitat within this portion of IR Site 42 is of degraded quality. However, fully protected birds have been observed within the NWR adjacent to the site, therefore this provision is potentially applicable.
Actions impacting migratory nongame birds	Actions must be taken to prevent the take or possession of any migratory nongame birds.	Migratory nongame birds.	Cal. Fish & Game Code § 3513	2,3			The majority of the birds in the NWR are migratory non-game birds. This provision is potentially applicable
Actions impacting mountain lions	Action must be taken to avoid injuring, taking, possessing, or transporting any mountain lion.		Cal. Fish & Game Code § 4800				Not an ARAR. Mountain lions and/or their habitat have not been observed on or near IR Site 42.
Actions impacting fully protected mammals	Action must be taken to assure that no fully protected mammals are taken or possessed at any time.		Cal. Fish & Game Code § 4700				Not an ARAR. Fully protected mammals and/or their habitats have not been observed on or near IR Site 42.
Actions impacting fully protected reptiles and amphibians	Prohibits the take or possession of fully protected reptiles and amphibians as listed.		Cal. Fish & Game Code § 5050				Not an ARAR. Such reptiles and amphibians and/or their habitats have not been observed on or near IR Site 42.

Table A4-2 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Discharge to waters of the state	Prohibits the passage of enumerated substances or materials into waters of the state deleterious to fish, plant life, or birds.		Cal. Fish & Game Code §§ 5650(a) and (f); 5651	2,3			Not an ARAR. There is potential for contaminants to pass into water during removal activities at IR Site 42. This provision is potentially applicable
Actions impacting nongame birds	Actions must be taken to prevent the take of nongame birds.	Nongame Birds.	Cal. Fish & Game Code § 3800				Not an ARAR. The proposed removal action at IR Site 42 does not include the 'take' of nongame birds.
Actions impacting fur-bearing mammals	Provides manners under which fur-bearing mammals may be taken.	Fur-bearing mammals.	Cal. Fish & Game Code § 4000				Not an ARAR. Fur-bearing mammals have not been observed at IR Site 42.
Actions impacting nongame mammals	Action must be taken to avoid the take or possession of nongame mammals.	Nongame Mammals.	Cal. Fish & Game Code § 4150				Not an ARAR. Nongame mammals have not been observed at IR Site 42.
Actions impacting tidal invertebrates	Prohibits the taking of mollusks, crustaceans, or other invertebrates without a permit.	Tidal invertebrates.	Cal. Fish & Game Code § 8500				Not an ARAR. Tidal invertebrates have not been observed on or near IR Site 42.
***California Code of Regulations*, Title 14, Natural Resources**[b]							
Activity affecting protected amphibians and reptiles	Actions must be taken to avoid taking listed protected amphibians and reptiles.		Cal. Code Regs. tit. 14, §§ 40, 41 and 42				Not an ARAR. Such amphibians and reptiles and/or their habitats have not been observed on or near IR Site 42.
Activity affecting fur-bearing animals	Action must be taken to avoid taking listed fur-bearing animals.		Cal. Code Regs. tit. 14, § 460				Not an ARAR. Such fur-bearing animals and/or their habitats have not been observed on or near IR Site 42.

Table A4-2 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal

Action	Requirement	Prerequisites	Citation	ARAR Determination A	ARAR Determination RA	ARAR Determination TBC	Comments
Air Quality Management District/Air Pollution Control District[b]							
Visible emissions	Visible emissions standard that states a person shall not discharge any air contaminant into the atmosphere from any single source of emission for a period or periods aggregating more than 3 minutes in a 60-minute period, which is (a) as dark or darker in shade as that designated No. 1 on the Ringelmann Chart, or (b) of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in (a).	Applies to visible emission to air.	SCAQMD Rule 401	2,3			The proposed removal activities have the potential to produce visible emissions due to fugitive dust. Substantive requirements pertaining to visible emissions, such as wetting the soil or waste, may be required to minimize fugitive dust.
Nuisance emissions	Nuisance standard that states a person shall not discharge from any source such quantities of air contaminants or other materials that cause injury, detriment, nuisance, or annoyance to a considerable number of persons or to the public.	Applies to discharge to air.	SCAQMD Rule 402				Not an ARAR. The nuisance rule includes subjective, nonenvironmental criteria such as "annoyance," "comfort," and "repose." As such, the DON is troubled by the vague and subjective nature of the nuisance rule and the lack of objective "standards, requirements, criteria, or limitations" within the meaning of Section 121(d)(2) of CERCLA. Other federal and state ARARs addressing actual and potential air emissions will assure adequate protection of human health and the environment.

Table A4-2 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal

Action	Requirement	Prerequisites	Citation	ARAR Determination			Comments
				A	RA	TBC	
Fugitive Dust	Shall not cause or allow the emissions of fugitive dust such that the presence of such dust remains visible in the atmosphere beyond the property line of the emission source and shall not cause or allow PM_{10} levels to exceed 50 micrograms per cubic meter when determined, by simultaneous sampling, as the difference between upwind and downwind samples.		SCAQMD Rule 403	2,3			Fugitive dust can be generated from any grading and earth-moving activities including placement of various cover layers and consolidation of wastes. Substantive requirements pertaining to fugitive dust emission control will be applicable.
Particulate Matter	Shall limit equipment from discharging particulate emissions in excess of 0.01 to 0.196 grain per cubic foot based on a given volumetric exhaust gas flow rate averaged over one hour or one cycle of operation. Steam generators or gas turbines are excluded from this rule.		SQAMD Rule 404				Not an ARAR. The proposed removal action does not include utilizing equipment that will discharge particulate emissions into the air.
Solid Particulate Matter	Shall limit equipment from discharging particulate emissions in excess of 0.99 to 30 pounds per hour based on a given process weight.		SCAQMD Rule 405				Not an ARAR. The proposed removal action does not include utilizing equipment that will discharge particulate emissions into the air.

Table A4-2 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal							
				ARAR Determination			
Action	**Requirement**	**Prerequisites**	**Citation**	**A**	**RA**	**TBC**	**Comments**
Liquid and Gaseous Air Contaminants	Shall limit equipment from discharging carbon monoxide emissions in excess of 2000 ppm and sulfur dioxide emissions of 500 ppm or greater averaged over 15 minutes. The stationary internal combustion engines, propulsion of mobile equipment or emergency venting are excluded.		SCAQMD Rule 406				Not an ARAR. No carbon monoxide and sulfur dioxide emissions are anticipated for the proposed removal action at IR Site 42.
Circumvention	Prohibits a person from building, erecting, installing or using any equipment, the use of which reduces or conceals an emission which would otherwise constitute a violation of these rules.		SCAQMD Rule 408				Not an ARAR. No installation of any equipment which might conceal an emission will be used at the IR Site 42.
Fuel Combustion Contaminants	Shall limit the emission of particulate matter from exhaust of a combustion source to 0.23 grams per cubic at 12 percent CO2 averaged over 15 minutes. Internal combustion engines shall be excluded.		SCAQMD Rule 409				Not an ARAR. No emissions from the combustion source are anticipated for the proposed removal action at IR Site 42.
Sulfur content of gaseous, liquid or fossil fuels	Shall limit sulfur compounds from combustion of gaseous fuels not to exceed 40 ppm, 0.05 percent by weight for liquid fuels and 0.56 pounds of sulfur per million BTU for solid fossil fuels.		SCAQMD Rule 431.1, 431.2, 431.3				Not an ARAR. No sulfur compound emissions from the combustion source are anticipated for the proposed removal action at IR Site 42.

Table A4-2 (continued)

EE/CA Alternatives: 1 – No action[a]; 2 – Partial excavation with off-site disposal; and 3 – Excavation with off-site disposal

Action	Requirement	Prerequisites	Citation	ARAR Determination			Comments
				A	RA	TBC	
Fuel burning equipment-oxides of nitrogen	Shall limit the concentration of oxides of nitrogen averaged over 15 minutes, from any non-mobile fuel burning equipment, to a range of 125 to 300 ppm for gaseous fuels and 225 to 400 ppm for solid and liquid fuels depending on equipment size.		SCAQMD Rule 474				Not an ARAR. The emission of oxides of nitrogen from the mobile fuel burning equipment is not anticipated for the proposed removal action at IR Site 42.
National emission standards for hazardous air pollutants	Shall apply to the owner or operator of any stationary source emitting hazardous air pollutants for which a standard is prescribed under this regulation.		SCAQMD Regulation X				Not an ARAR. There will be no stationary sources that emit air contaminants for the proposed removal action at IR Site 42.
Excavation of Landfill Sites	Requires person excavating a landfill to identify mitigation measures to ensure that a public nuisance condition does not occur.		SCAQMD Rule 1150				Not an ARAR. IR Site 42 is not a landfill.
Air emission	T-BACT must be employed for new stationary equipment when the operation of that equipment results in a higher than allowable maximum individual cancer risk.	Stationary source that emits carcinogenic air contaminants.	SCAQMD/APCD Rule 1401				Not an ARAR. There will be no stationary sources that emit air contaminants.

Table A4-2 (continued)

Notes:

[a] discussion of compliance with action-specific ARARs is not appropriate

[b] statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the DON accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only substantive requirements of the specific actions are considered potential ARARs.

Acronyms/Abbreviations:

A – applicable
ARAR – applicable or relevant and appropriate requirement
art. – article
CAI – closed, abandoned, or inactive
Cal. Code Regs. – *California Code of Regulations*
Cal. Fish & Game Code – *California Fish and Game Code*
Cal. Health & Safety Code – *California Health and Safety Code*
Cal. Pub. Res. Code – *California Public Resources Code*
Cal. Water Code – *California Water Code*
CEQA – California Environmental Quality Act
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R. – *Code of Federal Regulations*
ch. – chapter
CWA – Clean Water Act
div. – division
DON – Department of the Navy
EE/CA – engineering evaluation/cost analysis
IR – Installation Restoration (Program)
mg/L – milligrams per liter
NPDES – National Pollutant Discharge Elimination System
para. – paragraph
Prop. – proposition
RA – relevant and appropriate
Res. – resolution
RWQCB – (California) Regional Water Quality Control Board, Santa Ana Region
§ – section
SCAQMD – South Coast Air Quality Management District
subch. – subchapter
SWRCB – (California) State Water Resources Control Board
TBC – to be considered
tit. – title

Table A4-3
Comparison of Monitoring ARARs

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Monitoring	§ 66264.91(a)(1) Institute a detection monitoring program under § 66264.98 for each unit; (2) institute an evaluation monitoring program under § 66264.99 whenever there is statistically significant evidence of a release from the regulated unit during a detection monitoring program; or (3) whenever there is significant physical evidence of a release from the regulated unit, including unexplained volumetric changes in surface impoundments, unexplained stress in biological communities, unexplained changes in soil coloration, visible signs of leachate migration, unexplained water table mounding beneath or adjacent to the regulated unit, and any other change to the environment that could reasonably be expected to be the result of a release from the regulated unit; and (4) institute a corrective action program under § 66264.100 when it is determined pursuant to § 66264.99 that the assessment of the nature and extent of the release and the design of the corrective action program have been satisfactorily completed.	§ 2550.1(a)(1) The discharger shall institute a detection monitoring program under § 2550.8 for each waste management unit; (2) the discharger shall institute an evaluation monitoring program under § 2550.9 whenever there is statistically significant evidence of a release from the waste management unit during a detection monitoring program; or (3) whenever there is significant physical evidence of a release from the waste management unit, including unexplained volumetric changes in surface impoundments, unexplained stress in biological communities, unexplained changes in soil characteristics, visible signs of leachate migration, and unexplained water table mounding beneath or adjacent to the waste management unit and any other change to the environment that could reasonably be expected to be the result of a release from the waste management unit; and (4) the discharger shall institute a corrective action program under § 2550.10 when, pursuant to § 2550.9, the assessment of the nature and extent of the release and the design of a corrective action program has been satisfactorily completed.	§ 20385(a)(1) The discharger shall institute a detection monitoring program (under § 20420) for each unit; (2) the discharger shall institute an evaluation monitoring program (under § 20425) whenever there is "measurably significant" evidence of a release from the unit during a detection monitoring program (under § 20420); or (3) whenever there is significant physical evidence of a release from the unit, including unexplained volumetric changes in surface impoundments, unexplained stress in biological communities, unexplained changes in soil characteristics, visible signs of leachate migration, and unexplained water table mounding beneath or adjacent to the unit, and any other change to the environment that could reasonably be expected to be the result of a release from the unit; and (4) the discharger shall institute a corrective action program under § 20430 when the assessment of the nature and extent of the release and the design of a corrective action program has been satisfactorily completed.	Cal. Code Regs., tit. 22, § 66264.91(a)(1), (2), (3), (4), (b), and (c)

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Monitoring (continued)	(b) For each regulated unit, include one or more of the programs identified in subsection (a) of this section in the facility permit as may be necessary to protect human health or the environment and specify the circumstances under which each of the programs will be required. In deciding whether to institute a particular program, consider the potential adverse effects on human health or the environment that might occur before final administrative action on a permit modification application to incorporate such a program could be taken.	(b) One or more of the programs identified in subsection (a) of this section that are appropriate for the prevailing state of containment at the waste management unit may be required. In deciding whether a particular program is required, potential adverse effects on human health or the environment that might occur shall be considered before program action could be taken. (c) In conjunction with an evaluation monitoring program or a corrective action	(b) For each unit, one or more of the programs identified in ¶(a) that are appropriate for the prevailing state of containment at the unit shall be required, and the circumstances will be specified under which each of the programs will be required. In deciding whether to require the discharger to be prepared to institute a particular program, the RWQCB shall consider the potential adverse effects on human health or the environment that might occur before final administrative action on an amended report of waste discharge to incorporate such a program could be taken.	
	(c) In conjunction with an evaluation monitoring program or a corrective action program, continue to conduct a detection monitoring program under § 66264.98 as necessary to provide the best assurance of the detection of subsequent releases from the regulated unit.	program, the discharger shall continue to conduct a detection monitoring program under § 2550.8 as necessary to provide the best assurance of the detection of subsequent releases from the waste management unit.	(c) In conjunction with an evaluation monitoring program or a corrective action program, the discharger shall continue to conduct a detection monitoring program as necessary to provide the best assurance of the detection of subsequent releases from the unit.	
COCs	§ 66264.93 COCs are the waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the regulated unit.	§ 2550.3 COCs are the waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the waste management unit.	§ 20395(a) The COC list shall include all waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the unit.	Cal. Code Regs., tit. 22, § 66264.93

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Concentration limits	§ 66264.94(a)(1) and (3) For each COC the owner or operator shall propose for each medium (groundwater, surface water, and the unsaturated zone) monitored a concentration limit not to exceed the background value or a CLGB established for a corrective action program.	§ 2550.4(a)(1) and (3) For each COC, the discharger shall propose for each medium (including groundwater, surface water, and the unsaturated zone) monitored a concentration limit not to exceed the background value or a CLGB established for a corrective action program.	20400(a)(1) and (3) For each COC, the discharger shall propose for each medium (including groundwater, surface water, and the unsaturated zone) monitored: a concentration limit not to exceed the background value or a CLGB established for a corrective action program.	Cal. Code Regs., tit. 22, § 66264.94(a)(1) and (3)
	§ 66264.94(c) A concentration limit that is greater than the background value can only be used if demonstrated that it is technologically or economically infeasible to achieve the background value and the COC will not pose a substantial present or potential hazard to human health or the environment.	§ 2550.4(c) A concentration limit that is greater than the background value can be used only if it is technologically or economically infeasible to achieve the background value and the COC will not pose a substantial present or potential hazard to human health or the environment.	§ 20400(c) For a corrective action program, a CLGB can be used only if it is technologically or economically infeasible to achieve the background value and it will not pose a substantial present or potential hazard to human health or the environment.	Cal. Code Regs., tit. 22, § 66264.94(c)
	§ 66264.94(d) In establishing a CLGB, the following factors shall be considered: potential adverse effects on groundwater and surface water quality; any identification of underground sources of drinking water; risk being evaluated for groundwater as if exposure would occur at the point of compliance.	§ 2550.4(d) In establishing a CLGB, groundwater and surface water quality shall be considered.	§ 20400(d) In establishing a CLGB for a COC, the RWQCB shall consider groundwater and surface water quality.	Cal. Code Regs., tit. 22, § 66264.94(d)
	§ 66264.94(e) In no event shall a concentration limit greater than background exceed other applicable statutes or regulations (e.g., an MCL) and the lowest concentration demonstrated to be technologically and economically achievable.	§ 2550.4(e) In no event shall a concentration limit greater than background exceed the lowest concentration that the discharger demonstrates is technologically and economically achievable. No concentration limit greater than background may exceed the maximum concentration that would be allowed under other applicable statutes or regulations (e.g., MCLs).	§ 20400(e) In no event shall a CLGB exceed the lowest concentration that the discharger demonstrates is technologically and economically achievable. No provision of this section shall be taken to allow a CLGB to exceed the maximum concentration that would be allowed under other applicable statutes or regulations (e.g., MCLs).	Cal. Code Regs., tit. 22, § 66264.94(e)

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Point of compliance	§ 66264.95(a) The point of compliance is a vertical surface, located at the hydraulically downgradient limit of the waste management area that extends through the uppermost aquifer underlying the regulated unit.	§ 2550.5(a) The point of compliance is a vertical surface located at the hydraulically downgradient limit of the waste management unit that extends through the uppermost aquifer underlying the unit.	§ 20405 The point of compliance is a vertical surface located at the hydraulically downgradient limit of the unit that extends through the uppermost aquifer underlying the unit.	Cal. Code Regs., tit. 22, § 66264.95(a)
Groundwater monitoring	§ 66264.97(b)(1) The owner or operator shall establish a groundwater monitoring system for each regulated unit and include (A) a sufficient number of background monitoring points installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater that has not been affected by a release from the regulated unit; (B) for a detection monitoring program under § 66264.98: (1) a sufficient number of monitoring points installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the point of compliance and to allow for the detection of a release from the regulated unit; (2) a sufficient number of monitoring points installed at additional locations and depths to yield groundwater samples from the uppermost aquifer as necessary to provide the best assurance of the earliest possible detection of a release from the regulated unit; and (3) a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield	§ 2550.7(b)(1) The discharger shall establish a groundwater monitoring system for each waste management unit (A) and include a sufficient number of background monitoring points installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater that has not been affected by a release from the waste management unit; (B) for a detection monitoring program under § 2550.8 of this article: (1) a sufficient number of monitoring points installed at appropriate locations and depths to yield groundwater samples from the uppermo st aquifer that represent the quality of groundwater passing the point of compliance and to allow for the detection of a release from the waste management unit; (2) a sufficient number of monitoring points installed at additional locations and depths to yield groundwater samples from the uppermost aquifer to provide the best assurance of the earliest possible detection of a release from the waste management unit; (3) a sufficient number of monitoring points and background monitoring points installed at appropriate locations and	§ 20415(b)(1) The discharger shall establish a groundwater monitoring system for each unit (A) and include a sufficient number of background monitoring points installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater that has not been affected by a release from the unit; (B) for a detection monitoring program under § 20420: (1) a sufficient number of monitoring points (as defined in § 20164) installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the point of compliance and to allow for the detection of a release from the unit; (2) a sufficient number of monitoring points installed at additional locations and depths to yield groundwater samples from the uppermost aquifer to provide the best assurance of the earliest possible detection of a release from the unit; (3) a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield groundwater samples from portions of	Cal. Code Regs., tit. 22, § 66264.97(b)(1) (A), (B)(1), (2), (3), (C)(1), (2), (D)(1), (2), (b)(2), (4), (5), (6), and (7)

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Groundwater monitoring (continued)	groundwater samples from other aquifers, low-yielding saturated zones, and zones of perched water as necessary to provide the best assurance of the earliest possible detection of a release from the regulated unit; (C) for an evaluation monitoring program under § 66264.99: (1) a sufficient number of monitoring points installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the point of compliance, and at other locations in the uppermost aquifer as necessary, to provide the data needed to evaluate changes in water quality due to the release from the regulated unit; and (2) a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield groundwater samples from other aquifers, low-yielding saturated zones, and zones of perched water as necessary to provide the data needed to evaluate changes in water quality due to the release from the regulated unit; (D) for a corrective action program under § 66264.100 of this article: (1) a sufficient number of monitoring points installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the	depths to yield groundwater samples from portions of the zone of saturation, including other aquifers, not monitored pursuant to subsections (b)(1)(B)1 and (b)(1)(B)2 of this section to provide the best assurance of the earliest possible detection of a release from the waste management unit; (4) a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield groundwater samples from zones of perched water to provide the best assurance of the earliest possible detection of a release from the waste management unit; and (5) monitoring point locations and depths that include the zone(s) of highest hydraulic conductivity in each groundwater body monitored pursuant to this subsection. (C) for an evaluation monitoring program under § 2550.9 of this article: (1) a sufficient number of monitoring points installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the point of compliance and at other locations in the uppermost aquifer to provide the data needed to evaluate changes in water quality due to the release from the waste management unit; (2) a sufficient number of monitoring points and background monitoring points installed at appropriate locations and	the zone of saturation, including other aquifers, not monitored pursuant to ¶(b)(1)(B)1 and ¶(b)(1)(B)2, to provide the best assurance of the earliest possible detection of a release from the unit; (4) a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield groundwater samples from zones of perched water to provide the best assurance of the earliest possible detection of a release from the unit; and (5) monitoring point locations and depths that include the zone(s) of highest hydraulic conductivity in each groundwater body monitored pursuant to this subsection [i.e., under ¶(b), inclusive]. (C) for an evaluation monitoring program under § 20425: (1) a sufficient number of monitoring points installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the point of compliance and at other locations in the uppermost aquifer to provide the data needed to evaluate changes in water quality due to the release from the unit; (2) a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield groundwater samples from portions of the zone	

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Groundwater monitoring (continued)	point of compliance, and at other locations in the uppermost aquifer as necessary, to provide the data needed to evaluate compliance with the water quality protection standard and to evaluate the effectiveness of the corrective action program; and (2) a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield groundwater samples from other aquifers, low-yielding saturated zones, and zones of perched water as necessary to provide the data needed to evaluate compliance with the water quality protection standard and to evaluate the effectiveness of the corrective action program. (b)(2) The groundwater monitoring system may include background monitoring points that are not hydraulically upgradient of the regulated unit if the owner or operator demonstrates to the satisfaction of the Department that sampling at other monitoring points will provide samples that are representative of the background quality of groundwater or are more representative than those provided by the upgradient monitoring points.	depths to yield groundwater samples from portions of the zone of saturation, including other aquifers, not monitored pursuant to subsection (b)(1)(C)1 of this section to provide the data needed to evaluate changes in water quality due to the release from the waste management unit; and (3) a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield groundwater samples from zones of perched water to provide the data needed to evaluate changes in water quality due to the release from the waste management unit; and (D) for a corrective action program under § 2550.10 of this article: (1) a sufficient number of monitoring points installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the point of compliance and at other locations in the uppermost aquifer to provide the data needed to evaluate the effectiveness of the corrective action program; (2) a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield groundwater samples from portions of the zone of saturation, including other aquifers, not monitored pursuant to subsection (b)(1)(D)1 of this	of saturation, including other aquifers, not monitored pursuant to ¶(b)(1)(C)1, to provide the data needed to evaluate changes in water quality due to the release from the unit; and (3) a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield groundwater samples from zones of perched water to provide the data needed to evaluate changes in water quality due to the release from the unit; and (D) for a corrective action program under § 20430: (1) a sufficient number of monitoring points installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the point of compliance and at other locations in the uppermost aquifer to provide the data needed to evaluate the effectiveness of the corrective action program; (2) a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield groundwater samples from portions of the zone of saturation, including other aquifers, not monitored pursuant to ¶(b)(1)(D)1, to provide the data needed to evaluate the effectiveness of the corrective action program; and	

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Groundwater monitoring (continued)	(b)(4) All monitoring wells shall be cased and constructed in a manner that maintains the integrity of the monitoring well borehole and prevents the borehole from acting as a conduit for contaminant transport. (b)(5) The sampling interval of each monitoring well shall be appropriately screened and fitted with an appropriate filter pack to enable collection of representative groundwater samples. (b)(6) For each monitoring well the annular space (i.e., the space between the borehole and well casing) above and below the sampling interval shall be appropriately sealed to prevent entry of contaminants from the surface, entry of contaminants from the unsaturated zone, cross-contamination of saturated zones, and contamination of samples. (b)(7) All monitoring wells shall be adequately developed to enable collection of representative groundwater samples.	section to provide the data needed to evaluate the effectiveness of the corrective action program; and (3) a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield groundwater samples from zones of perched water to provide the data needed to evaluate the effectiveness of the corrective action program. (b)(2) The groundwater monitoring system may include background monitoring points that are not hydraulically upgradient of the waste management unit if the discharger demonstrates to the satisfaction of the regional board that sampling at other monitoring points will provide samples that are representative of the background quality of groundwater or are more representative than those provided by the upgradient monitoring points. (b)(4) All monitoring wells shall be cased and constructed in a manner that maintains the integrity of the monitoring well borehole and prevents the borehole from acting as a conduit for contaminant transport. (b)(5) The sampling interval of each monitoring well shall be appropriately screened and fitted with an appropriate	(3) a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield groundwater samples from zones of perched water to provide the data needed to evaluate the effectiveness of the corrective action program. (2) Alternate Background Locations—The groundwater monitoring system may include background monitoring points that are not hydraulically upgradient of the unit if the discharger demonstrates to the satisfaction of the RWQCB that sampling at other background monitoring points will provide samples that are representative of the background quality of groundwater or are more representative than those provided by the upgradient background monitoring points. (4)(A) All monitoring wells shall be cased and constructed in a manner that maintains the integrity of the monitoring well borehole and prevents the borehole from acting as a conduit for contaminant transport. (4)(B) The sampling interval of each monitoring well shall be appropriately screened and fitted with an appropriate filter pack to enable collection of	

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Groundwater monitoring (continued)		filter pack to enable collection of representative groundwater samples. (b)(6) For each monitoring well, the annular space (i.e., the space between the borehole and well casing) above and below the sampling interval shall be appropriately sealed to prevent entry of contaminants from the ground surface, entry of contaminants from the unsaturated zone, cross-contamination between portions of the zone of saturation, and contamination of samples. (b)(7) All monitoring wells shall be adequately developed to enable collection of representative groundwater samples.	representative groundwater samples. (4)(C) For each monitoring well, the annular space (i.e., the space between the borehole and well casing) above and below the sampling interval shall be appropriately sealed to prevent entry of contaminants from the ground surface, entry of contaminants from the unsaturated zone, cross-contamination between portions of the zone of saturation, and contamination of samples. (4)(D) All monitoring wells shall be adequately developed to enable collection of representative groundwater samples.	
Surface water monitoring	§ 66264.97(c)(1) The owner or operator shall establish a surface-water monitoring system to monitor each surface-water body that could be affected by a release from the regulated unit including (2)(A) a sufficient number of background monitoring points established at appropriate locations and depths to yield samples from each surface-water body to represent the quality of the surface water that has not been affected by a release from the regulated unit; (B) for a detection monitoring program under § 66264.98, a sufficient number of monitoring points established at appropriate locations and depths to yield	§ 2550.7(c)(1) The discharger shall establish a surface-water monitoring system to monitor each surface-water body that could be affected by a release from the waste management unit including (2)(A) a sufficient number of background monitoring points established at appropriate locations and depths to yield samples from each surface-water body that represent the quality of surface water that has not been affected by a release from the waste management unit; (B) for a detection monitoring program under § 2550.8 of this article, a sufficient number of monitoring points established at appropriate locations and	§ 20415(c)(1) The discharger shall establish a surface-water monitoring system to monitor each surface-water body that could be affected by a release from the unit including (2)(A) a sufficient number of background monitoring points established at appropriate locations and depths to yield samples from each surface- water body that represent the quality of surface water that has not been affected by a release from the unit; (B) for a detection monitoring program (under § 20420), a sufficient number of monitoring points established at appropriate locations and depths to yield samples from each surface-water body that provide the best	Cal. Code Regs., tit. 22, § 66264.97(c)(1),(2)(A), (B), (C), (D)

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Surface water monitoring (continued)	samples from each surface-water body that provide the best assurance of the earliest possible detection of a release from the regulated unit; (C) for an evaluation monitoring program under § 66264.99, a sufficient number of monitoring points established at appropriate locations and depths to yield samples from each surface-water body that provide the data necessary to evaluate changes in water quality due to the release from the regulated unit; and (D) for a corrective action program under § 66264.100, a sufficient number of monitoring points established at appropriate locations and depths to yield samples that provide the data necessary to evaluate compliance with the water quality protection standard and to evaluate the effectiveness of the corrective action program.	depths to yield samples from each surface-water body that provide the best assurance of the earliest possible detection of a release from the waste management unit; (C) for an evaluation monitoring program under § 2550.9 of this article, a sufficient number of monitoring points established at appropriate locations and depths to yield samples from each surface-water body that provide the data to evaluate changes in water quality due to the release from the waste management unit; and (D) for a corrective action program under § 2550.10 of this article, a sufficient number of monitoring points established at appropriate locations and depths to yield samples from each surface-water body that provide the data to evaluate compliance with the water quality protection standard and to evaluate the effectiveness of the corrective action program.	assurance of the earliest possible detection of a release from the unit; (C) for an evaluation monitoring program (under § 20425), a sufficient number of monitoring points established at appropriate locations and depths to yield samples from each surface-water body that provide the data to evaluate changes in water quality due to the release from the unit; and (D) for a corrective action program (under § 20430), a sufficient number of monitoring points established at appropriate locations and depths to yield samples from each surface-water body that provide the data to evaluate compliance with the Water Standard (of § 20390) and to evaluate the effectiveness of the corrective action program.	
Unsaturated zone monitoring	§ 66264.97(d)(1) The owner or operator shall establish an unsaturated zone monitoring system for each regulated unit including (2)(A) a sufficient number of background monitoring points established at appropriate locations and depths to yield soil-pore liquid samples or soil-pore liquid measurements that represent the quality of soil-pore liquid that has not	§ 2550.7(d)(1) The discharger shall establish an unsaturated zone monitoring system for each waste management unit including (2)(A) a sufficient number of background monitoring points established at appropriate locations and depths to yield soil-pore liquid samples or soil-pore liquid measurements that represent the quality of soil-pore liquid that has not been affected by a release from the waste	for each unit including (2)(A) a sufficient number of background monitoring points established at appropriate locations and depths to yield soil-pore liquid samples or soil-pore liquid measurements that represent the quality of soil-pore liquid that has not been affected by a release from the unit; (B) for a detection monitoring program (under § 20420), a sufficient number of monitoring points established at appropriate locations and	Cal. Code Regs., tit. 22, § 66264.97(d)(1), (2)(A), (B), (C), (D), (3), (4), (5)

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Unsaturated zone monitoring (continued)	been affected by a release from the regulated unit; (B) for a detection monitoring program under § 66264.98, a sufficient number of monitoring points established at appropriate locations and depths to yield soil-pore liquid samples or soil-pore liquid measurements that provide the best assurance of the earliest possible detection of a release from the regulated unit; (C) for an evaluation monitoring program under § 66264.99, a sufficient number of monitoring points established at appropriate locations and depths to yield soil-pore liquid samples or soil-pore liquid measurements as necessary to provide the data needed to evaluate changes in water quality due to the release from the regulated unit; and (D) for a corrective action program under § 66264.100, a sufficient number of monitoring points established at appropriate locations and depths to yield soil-pore liquid samples or soil-pore liquid measurements as necessary to provide the data needed to evaluate compliance with the water quality protection standard and to evaluate the effectiveness of the corrective action program.	management unit; (B) for a detection monitoring program under § 2550.8 of this article, a sufficient number of monitoring points established at appropriate locations and depths to yield soil-pore liquid samples or soil-pore liquid measurements that provide the best assurance of the earliest possible detection of a release from the waste management unit; (C) for an evaluation monitoring program under § 2550.9 of this article, a sufficient number of monitoring points established at appropriate locations and depths to yield soil-pore liquid samples or soil-pore liquid measurements that provide the data to evaluate changes in water quality due to the release from the waste management unit; and (D) for a corrective action program under § 2550.10 of this article, a sufficient number of monitoring points established at appropriate locations and depths to yield soil-pore liquid samples or soil-pore liquid measurements that provide the data to evaluate compliance with the water quality protection standard and to evaluate the effectiveness of the corrective action program.	20415(d)(1) The discharger shall establish an unsaturated zone monitoring system depths to yield soil-pore liquid samples or soil-pore liquid measurements that provide the best assurance of the earliest possible detection of a release from the unit; (C) for an evaluation monitoring program (under § 20425), a sufficient number of monitoring points established at appropriate locations and depths to yield soil-pore liquid samples or soil-pore liquid measurements that provide the data to evaluate changes in water quality due to the release from the unit; and (D) for a corrective action program (under § 20430), a sufficient number of monitoring points established at appropriate locations and depths to yield soil-pore liquid samples or soil-pore liquid measurements that provide the data to evaluate compliance with the Water Standard (of § 20390) and to evaluate the effectiveness of the corrective action program. (3) background monitoring points shall be installed at a background plot having soil characteristics similar to those of the soil underlying the unit.	

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Unsaturated zone monitoring (continued)	(3) Background monitoring points shall be installed at a background plot having soil characteristics similar to those of the soil underlying the regulated unit. (4) Liquid recovery types of unsaturated zone monitoring (e.g., the use of lysimeters) are required unless the owner or operator demonstrates to the satisfaction of the Department that such methods of unsaturated zone monitoring cannot provide an indication of a release from the regulated unit. The Department shall require complementary or alternative (nonliquid recovery) types of unsaturated zone monitoring as necessary to provide the best assurance of the earliest possible detection of a release from the regulated unit. (5) Unsaturated zone monitoring is required at all new regulated units unless the owner or operator demonstrates to the satisfaction of the Department that no method for unsaturated zone monitoring can provide any indication of a release from that regulated unit. For a regulated unit that has operated or has received all permits necessary for construction and	(3) Background monitoring points shall be installed at a background plot having soil characteristics similar to those of the soil underlying the waste management unit. (4) Liquid recovery types of unsaturated zone monitoring (e.g., the use of lysimeters) are required unless the discharger demonstrates to the satisfaction of the regional board that such methods of unsaturated zone monitoring cannot provide an indication of a release from the waste management unit. The regional board shall require complementary or alternative (nonliquid recovery) types of unsaturated zone monitoring to provide the best assurance of the earliest possible detection of a release from the waste management unit. (5) Unsaturated zone monitoring is required at all new waste management units unless the discharger demonstrates to the satisfaction of the regional board that there is no unsaturated zone monitoring device or method designed to operate under the subsurface conditions existent at that waste management unit. For a waste management unit that has operated or has received all permits necessary for	(4) Liquid recovery types of unsaturated zone monitoring (e.g., the use of lysimeters) are required unless the discharger demonstrates to the satisfaction of the RWQCB that such methods of unsaturated zone monitoring cannot provide an indication of a release from the unit. The RWQCB shall require complementary or alternative (nonliquid recovery or remote sensing) types of unsaturated zone monitoring to provide the best assurance of the earliest possible detection of a release from the unit. (5) Unsaturated zone monitoring is required at all new units unless the discharger demonstrates to the satisfaction of the RWQCB that there is no unsaturated zone monitoring device or method designed to operate under the subsurface conditions existent at that unit. For a unit that has operated or has received all permits necessary for construction and operation before 01 July 1991, unsaturated zone monitoring is required unless the discharger demonstrates that either	

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Unsaturated zone monitoring (continued)	operation before 01 July 1991, unsaturated zone monitoring is required unless the owner or operator demonstrates that either there is no unsaturated zone monitoring device or method designed to operate under the subsurface conditions existent at that waste management unit or the installation of unsaturated zone monitoring devices would require unreasonable dismantling or relocating of permanent structures.	construction and operation before 01 July 1991, unsaturated zone monitoring is required unless the discharger demonstrates that either there is no unsaturated zone monitoring device or method designed to operate under the subsurface conditions existent at that waste management unit or that installation of unsaturated zone monitoring devices would require unreasonable dismantling or relocating of permanent structures.	there is no unsaturated zone monitoring device or method designed to operate under the subsurface conditions existent at that unit or that installation of unsaturated zone monitoring devices would require unreasonable dismantling or relocating of permanent structures.	
General monitoring	§ 66264.97(e)(1) All monitoring systems shall be designed and certified by a registered geologist or a registered civil engineer. (3) If a facility contains contiguous regulated units, separate groundwater monitoring systems are not required for each such unit if the owner or operator demonstrates to the satisfaction of the Department that the water quality monitoring program for each unit will enable the earliest possible detection and measurement of a release from that unit. (5) The water quality monitoring program shall include appropriate sampling and analytical methods for groundwater, surface water, and the unsaturated zone that accurately measure the concentration of each COC and the concentration or value of each monitoring parameter. (6) For each regulated unit, the owner or operator shall collect all data necessary for selecting the appropriate statistical	§ 2550.7(e)(1) All monitoring systems shall be designed and certified by a registered geologist or a registered civil engineer. (3) If a facility contains contiguous waste management units, separate groundwater monitoring systems are not required for each such unit if the discharger demonstrates to the satisfaction of the regional board that the water quality monitoring program for each unit will enable the earliest possible detection and measurement of a release from that unit. (5) The water quality monitoring program shall include appropriate sampling and analytical methods for groundwater, surface water, and the unsaturated zone that accurately measure the concentration of each COC and the concentration or value of each monitoring parameter. (6) For each waste management unit, the discharger shall collect all data necessary for selecting the	§ 20415(e)(1) All monitoring systems shall be designed and certified by a registered geologist or a registered civil engineer. (3) If a facility contains contiguous units, separate groundwater monitoring systems are not required for each such unit if the discharger demonstrates to the satisfaction of the RWQCB that the water quality monitoring program for each unit will enable the earliest possible detection and measurement of a release from that unit. (5) The water quality monitoring program shall include appropriate sampling and analytical methods for groundwater, surface water, and the unsaturated zone that accurately measure the concentration of each COC and the concentration or value of each monitoring parameter. (6) For each unit, the discharger shall collect all data necessary for selecting the appropriate data analysis methods	Cal. Code Regs., tit. 22, § 66264.97(e)(1), (3), (5), and (6)

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
General monitoring (continued)	method pursuant to subsections (e)(7), (e)(8), and (e)(9) of this section and for establishing the background values pursuant to subsection (e)(11) of this section. At a minimum, these data shall include analytical data obtained during quarterly sampling of all background monitoring points for a period of 1 year, including the times of expected highest and lowest annual elevations of the groundwater surface. For a new regulated unit, these data shall be collected before wastes are discharged at the unit and background soil-pore liquid data shall be collected from beneath the unit before the unit is constructed.	appropriate statistical methods pursuant to subsections (e)(7), (e)(8), and (e)(9) of this section and for establishing the background values specified pursuant to subsection (e)(11) of this section. At a minimum, these data shall include analytical data obtained during quarterly sampling of all background monitoring points for a period of 1 year, including the times of expected highest and lowest annual elevations of the groundwater surface. For a new waste management unit, these data shall be collected before wastes are discharged at the unit and background soil-pore liquid data shall be collected from beneath the unit before the unit is constructed.	pursuant to ¶(e)(7–9) and for establishing the background values specified pursuant to ¶(e)(10). At a minimum, these data shall include analytical data obtained during quarterly sampling of all background monitoring points for a period of 1 year, including the times of expected highest and lowest annual elevations of the groundwater surface. For a new unit, these data shall be collected before wastes are discharged at the unit and background soil-pore liquid data shall be collected from beneath the unit before the unit is constructed.	
	§ 66264.97(e)(12)(B) The sampling method (including the sampling frequency and the interval of time between successive samples) shall be appropriate for the medium from which samples are taken (e.g., groundwater, surface water, and soil-pore liquid). The sampling method shall include a sequence of at least four samples collected at least semiannually from each monitoring point and each background monitoring point and statistical analysis performed at least semiannually. Samples shall be taken at an interval that assures, to the greatest extent possible, that an independent sample is obtained. More frequent sampling and statistical analysis may be required when necessary to protect human	§ 2550.7(e)(12)(B) The discharger shall propose the sampling methods to be used to establish background values and the sampling methods to be used for monitoring pursuant to this article. For groundwater, sampling shall be scheduled to include the times of expected highest and lowest elevations of the potentiometric surface and shall assure, to the greatest extent possible, that independent samples are obtained. In addition to any presampling purge prescribed in the sampling and analysis plan, groundwater monitoring wells shall be purged immediately after sampling is completed in order to remove all residual water that was in the wellbore during the sampling event so as to assure the	§ 20415(e)(12)(B) The sampling method (including the sampling frequency and the interval of time between successive samples) shall be appropriate for the medium from which samples are taken (e.g., groundwater, surface water, and soil-pore liquid). For groundwater, sampling shall be scheduled to include the times of expected highest and lowest elevations of the potentiometric surface. The sampling method shall assure, to the greatest extent possible, that independent samples are obtained. For groundwater, the discharger can use a postsampling purge to assure sample independence whenever the time between successive sampling events (for a given COC or monitoring parameter) is insufficient to	Cal. Code Regs., tit. 27, § 20415(e)(12)(B)

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
General monitoring (continued)	health and the environment. For groundwater, the sampling frequency and the interval between successive sampling events shall be based on the rate of groundwater flow, and on any variation in groundwater flow rate and direction. The rate of groundwater movement shall be calculated by reference to the aquifer's effective porosity, hydraulic conductivity, and hydraulic gradient. An alternative sampling method is allowed if it provides for the collection of not less than one sample quarterly from each monitoring point and background monitoring point and statistical analysis performed at least quarterly.	independence of samples from successive sampling events. The volume of well water to be withdrawn from the wellbore for the postsampling purge shall be determined by the same method used to determine adequate presampling purging. The sampling method selected shall include either: a sequence of at least four samples collected at least semiannually from each monitoring point and background monitoring point and statistical analysis carried out at least semiannually or more frequent sampling and statistical analysis where necessary to protect human health or the environment; or not less than one sample collected quarterly from each monitoring point and background monitoring point and statistical analysis performed at least quarterly.	assure sample independence, in which case the volume of well water to be withdrawn from the wellbore for the postsampling purge shall be determined by the same method used to determine adequate presampling purging. The sampling method selected shall include collection of at least the appropriate number of new data points (pursuant to ¶[e][12][A]) at least semiannually from each monitoring point and background monitoring point and data analysis carried out at least semiannually. More frequent sampling and statistical analysis may be required where necessary to protect human health or the environment.	
Detection monitoring	§ 66264.98(b) and (c) The owner or operator shall install appropriate water quality detection monitoring systems and shall establish a background value in accordance with § 66264.97 for each monitoring parameter and COC.	§ 2550.8(b) and (c) The discharger shall install appropriate water quality detection monitoring systems and establish a background value pursuant to § 2550.7 for each monitoring parameter and COC.	§ 20420(b) and (c) The discharger shall install appropriate water quality detection monitoring systems and shall establish a background value pursuant to § 20415 for each monitoring parameter and COC.	Cal. Code Regs., tit. 22, § 66264.98(b) and (c)
	§ 66264.98(f) The owner or operator shall conduct sampling and analyses for the monitoring parameters. For groundwater, sampling shall be scheduled to include the times of expected highest	§ 2550.8(f) The discharger shall monitor for the parameters listed in the waste discharge requirements pursuant to subsection (e) of this section.	§ 20420(f) The discharger shall monitor for the monitoring parameters listed in the WDRs pursuant to ¶(e).	Cal. Code Regs., tit. 22, § 66264.98(f)

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Detection monitoring (continued)	and lowest annual elevations of the groundwater surface.			
	§ 66264.98(g) In addition to monitoring for the monitoring parameters, the owner or operator shall periodically monitor for all COCs and determine whether there is statistically significant evidence of a release for any COC pursuant to § 66264.97. Monitoring pursuant to this subsection shall be conducted at least every 5 years.	§ 2550.8(g) In addition to monitoring for the monitoring parameters, the discharger shall periodically monitor for all COCs and determine whether there is statistically significant evidence of a release for any COC pursuant to § 2550.7. Monitoring pursuant to this subsection shall be conducted at least every 5 years.	§ 20420(g) In addition to monitoring for the monitoring parameters, the discharger shall periodically monitor for COCs specified in the WDRs, and shall determine whether there is "measurably significant" evidence of a release for any COC pursuant to § 20415. Monitoring pursuant to this paragraph shall be conducted at least every 5 years.	Cal. Code Regs., tit. 22, § 66264.98(g)
	§ 66264.98(i) For each monitoring point, the owner or operator shall determine whether there is statistically significant evidence of a release from the regulated unit for any monitoring parameter.	§ 2550.8(i) For each monitoring point, the discharger shall determine whether there is statistically significant evidence of a release from the waste management unit for any monitoring parameter.	§ 20420(i) For each monitoring point, the discharger shall determine whether there is "measurably significant" evidence of a release from the unit for any monitoring parameter (or COC).	Cal. Code Regs., tit. 22, § 66264.98(i)
Evaluation monitoring	§ 66264.99(b) The owner or operator shall collect and analyze all data necessary to assess the nature and extent of the release from the regulated unit. This assessment shall include a determination of the spatial distribution and concentration of each COC throughout the zone affected by the release. The owner or operator shall complete and submit this assessment to the Department within 90 days of establishing an evaluation monitoring program.	§ 2550.9(b) The discharger shall collect and analyze all data necessary to assess the nature and extent of the release from the waste management unit. This assessment shall include a determination of the spatial distribution and concentration of each COC throughout the zone affected by the release. The discharger shall complete and submit this assessment within 90 days of establishing an evaluation monitoring program.	§ 20425(b) The discharger shall collect and analyze all data necessary to assess the nature and extent of the release from the unit. This assessment shall include a determination of the spatial distribution and concentration of each COC throughout the zone affected by the release. The discharger shall complete and submit this assessment within 90 days of establishing an evaluation monitoring program. For MSW landfills, the discharger shall comply with the additional notification	Cal. Code Regs., tit. 22, § 66264.99(b)

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Evaluation monitoring (continued)			and monitoring system requirements incorporated by reference into SWRCB Res. 93-62, regarding notification and monitoring relative to off-site or potential off-site migration of waste constituents (see § 258.55[g][1][ii] and [iii] of 40 C.F.R. § 258).	
	§ 66264.99(c) Based on the data collected pursuant to subsections (b) and (e) of this section, the owner or operator shall update the engineering feasibility study required under § 66264.98(k)(6). The owner or operator shall submit this engineering feasibility study to the Department within 90 days of establishing an evaluation monitoring program.	§ 2550.9(c) Based on the data collected pursuant to subsections (b) and (e) of this section, the discharger shall update the engineering feasibility study for corrective action required pursuant to § 2550.8(k)(6) of this article. The discharger shall submit this engineering feasibility study to the regional board within 90 days of establishing an evaluation monitoring program.	§ 20425(c) Based on the data collected pursuant to ¶(b) and ¶(e), the discharger shall update the engineering feasibility study for corrective action required pursuant to § 20420(k)(6). The discharger shall submit this updated engineering feasibility study to the RWQCB within 90 days of establishing an evaluation monitoring program.	Cal. Code Regs., tit. 22, § 66264.99(c)
	66264.99(e) The owner or operator shall monitor groundwater, surface water, and the unsaturated zone to evaluate changes in water quality resulting from the release from the regulated unit. (2) The list of monitoring parameters for each medium shall include all hazardous constituents that have been detected in that mediu m and shall include those physical parameters, waste constituents, and reaction products that provide a reliable indication of changes in water quality resulting from the release from the regulated unit to that medium. (3) The owner or operator shall conduct sampling and analyses for the monitoring	§ 2550.9(e) The discharger shall monitor groundwater, surface water, and the unsaturated zone to evaluate changes in water quality resulting from the release from the waste management unit; (2) the list of monitoring parameters for each medium shall include all hazardous constituents that have been detected in that medium and those physical parameters, waste constituents, and reaction products that provide a reliable indication of changes in water quality resulting from any release from the waste management unit to that medium; (3) the discharger shall monitor for the monitoring parameters; (4) the discharger	20420(e) The discharger shall monitor groundwater, surface water, and the unsaturated zone to evaluate changes in water quality resulting from the release from the unit; (2) the list of monitoring parameters for each medium shall include all hazardous constituents that have been detected in that medium and those physical parameters, waste constituents, and reaction products that provide a reliable indication of changes in water quality resulting from any release from the unit to that medium; (3) the discharger shall monitor for the monitoring parameters listed; (4) in addition to monitoring for the monitoring parameters	Cal. Code Regs., tit. 22, § 66264.99(e)

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Evaluation monitoring (continued)	parameters. (4) The owner or operator shall periodically monitor for all COCs specified in the facility permit and evaluate changes in water quality due to the release from the regulated unit. The Department shall specify the frequencies for monitoring pursuant to this subsection after considering the degree of certainty associated with the demonstrated correlation between values for monitoring parameters and values for the COCs. (5) The owner or operator shall maintain a record of water quality analytical data as measured and in a form necessary for the evaluation of changes in water quality due to the release from the regulated unit.	shall periodically monitor for all COCs and evaluate changes in water quality due to the release from the waste management unit. Frequencies for monitoring will consider the degree of certainty associated with the demonstrated correlation between values for monitoring parameters and values for the COCs; (5) the discharger shall maintain a record of water quality analytical data as measured and in a form necessary for the evaluation of changes in water quality due to a release from the waste management unit; (6) the discharger shall analyze samples from all monitoring points in the affected medium for all constituents contained in Cal. Code Regs. tit. 22, app. IX, div. 4.5, ch. 14 (Appendix IX) at least annually to determine whether additional hazardous constituents are present and, if so, at what concentration(s). If the discharger finds Appendix IX constituents in the groundwater, surface water, or the unsaturated zone that are not already identified in the WDRs as COCs, the discharger may resample within 1 month and repeat the analysis for those constituents. If the second analysis confirms the presence of new constituents, the discharger shall report the concentration of these additional constituents to the regional board by certified mail within 7 days after the completion of the second analysis and the regional board shall add them to the list of	§ specified pursuant to ¶(e)(3), at least every 5 years, the discharger shall periodically monitor for all COCs specified in the WDRs to evaluate changes in water quality due to the release from the unit. The discharger shall use data analysis methods for conducting data analyses that comply with § 20415 for evaluating changes in water quality due to the release from the unit; (5) the discharger shall maintain a record of water quality analytical data as measured and in a form necessary for the evaluation of changes in water quality due to a release from the unit.	

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Evaluation monitoring (continued)		COCs specified in the WDRs unless the discharger demonstrates to the satisfaction of the regional board that the constituent is not reasonably expected to be in or derived from waste in the waste management unit. If the discharger does not resample, then the discharger shall report the concentrations of these additional constituents to the regional board by certified mail within 7 days after completion of the initial analysis and the regional board shall add them to the list of COCs specified in the WDRs unless the discharger demonstrates to the satisfaction of the regional board that the constituent is not reasonably expected to be in or derived from waste in the waste management unit.		
	§ 66264.99(f) If the owner or operator demonstrates to the satisfaction of the Department that a source other than the regulated unit caused the evidence of a release or that the evidence is an artifact caused by an error in sampling, analysis, or statistical evaluation, or by natural variation in groundwater, surface water, or the unsaturated zone, the owner or operator shall submit an application for a permit modification to reinstitute a detection monitoring program meeting the requirements of § 66264.98. This application shall include specifications	§ 2550.9(f) The discharger may demonstrate that a source other than the waste management unit caused the evidence of a release or that the evidence is an artifact caused by an error in sampling, analysis, or statistical evaluation, or by natural variation in groundwater, surface water, or the unsaturated zone. Upon a successful demonstration the regional board shall specify that the discharger shall reinstitute a detection monitoring program meeting the requirements of § 2550.8.	§ 20425(f) The discharger may demonstrate that a source other than the unit caused the evidence of a release or that the evidence is an artifact caused by an error in sampling, analysis, or statistical evaluation, or by natural variation in groundwater, surface water, or the unsaturated zone. Upon a successful demonstration, the RWQCB shall specify that the discharger shall reinstitute a detection monitoring program meeting the requirements of § 20420.	Cal. Code Regs., tit. 22, § 66264.99(f)

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Evaluation monitoring (continued)	for all appropriate changes to the monitoring program.			
	§ 66264.99(g) Interim corrective action measures shall be required where necessary to protect human health or the environment.	§ 2550.9(g) Interim corrective action measures shall be required where necessary to protect human health or the environment.	§ 20425(g) Interim corrective action measures shall be required where necessary to protect human health or the environment.	Cal. Code Regs., tit. 22, § 66264.99(g)
Corrective action monitoring	§ 66264.100(b) The owner or operator shall take corrective action to remediate releases from the regulated unit and to ensure that the regulated unit achieves compliance with the water quality protection standard.	§ 2550.10(b) The discharger shall take corrective action to remediate releases from the waste management unit and to ensure that the waste management unit achieves compliance with the water quality protection standard.	§ 20430(b) The discharger shall take corrective action to achieve the following goals: to remediate releases from the unit; to ensure that the discharger achieves compliance with the Water Standard.	Cal. Code Regs., tit. 22, § 66264.100(b)
	§ 66264.100(c) The owner or operator shall implement corrective action measures that ensure that COCs achieve their respective concentration limits at all monitoring points and throughout the zone affected by the release, including any portions of the affected zone that extend beyond the facility boundary, by removing the waste constituents or treating them in place. The owner or operator shall take other action to prevent noncompliance due to a continued or subsequent release including but not limited to source control.	§ 2550.10(c) The discharger shall implement corrective action measures that ensure that COCs achieve their respective concentration limits at all monitoring points and throughout the zone affected by the release, including any portions thereof that extend beyond the facility boundary, by removing the waste constituents or treating them in place. The discharger shall take other action to prevent noncompliance with those limits due to a continued or subsequent release from the waste management unit, including but not limited to source control.	§ 20430(c) The discharger shall implement corrective action measures that ensure that COCs achieve their respective concentration limits at all monitoring points and throughout the zone affected by the release, including any portions thereof that extend beyond the facility boundary, by removing the waste constituents or treating them in place. The discharger shall take other action to prevent noncompliance due to a continued or subsequent release from the unit, including but not limited to source control.	Cal. Code Regs., tit. 22, § 66264.100(c)

Table A4-3 (continued)

Action	California Code of Regulations Title 22	California Code of Regulations Title 23	California Code of Regulations Title 27	Controlling ARARs
Corrective action monitoring (contd.)	§ 66264.100(g)(1) Compliance "demonstration shall be based on the results of sampling and analysis for all constituents of concern for a period of one year."	§ 2550.10(g)(1) For compliance demonstration each "must have remained at or below its respective concentration limit during a proof period of at least one year . . . and . . . (2) each monitoring point must have been evenly distributed throughout the proof period and have consisted of no less than eight sampling events per year per monitoring point."	§ 20430(g)(1) For compliance demonstration each "must have remained at or below its respective concentration limit during a proof period of at least one year . . . and . . . (2) each Monitoring Point must have been evenly distributed throughout the proof period and have consisted of no less than eight sampling events per year per Monitoring Point."	Cal. Code Regs., tit. 22, § 66264.100(g)(1); Cal. Code Regs., tit. 23, § 2550.10(g)(2); and Cal. Code Regs tit. 27, § 20430(g)(2)

Acronyms/Abbreviations:
app. – appendix
ARAR – applicable or relevant and appropriate requirement
Cal. Code Regs. – *California Code of Regulations*
C.F.R. – *Code of Federal Regulations*
ch. – chapter
CLGB – concentration limit greater than background
COC – constituent of concern
div. – division
MCL – maximum containment level
MSW – municipal solid waste
¶ – paragraph
RWQCB – (California) Regional Water Quality Control Board
§ – section
SWRCB – (California) State Water Resources Control Board
tit. – title
WDR – waste discharge requirement

Department of Toxic Substances Control

Terry Tamminen
Agency Secretary
Cal/EPA

5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

October 7, 2004

Mr. T. R. Martin
Southwest Division
Naval Facilities Engineering Command
1220 Pacific Coast Highway
San Diego, California 92132-5190

RESPONSE TO REQUEST FOR IDENTIFICATION OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs): PROPOSED NON-TIME CRITICAL REMOVAL ACTION AT INSTALLATION RESTORATION (IR) PROGRAM SITE 42 (AUTO SHOP SUMP/WASTE OIL TANK), SITES 44/45 (WASTE DRUMS STORAGE/BLDG 88 FLOOR DRAIN) AND SWMU 57 (PAINT LOCKER AREA), NAVAL WEAPONS STATION (NWS), SEAL BEACH.

Dear Mr. Martin:

The California Department of Toxic Substances Control (DTSC) received your letter dated August 3, 2004 requesting state action-specific, chemical specific and location specific ARARs for proposed Non-Time Critical Removal Actions at IR Sites 42 (Auto shop Sump/Waste oil Tank), 44/45 (Waste Drums Storage/Bldg 88 Floor Drain Outlet), and SWMU 57 (Paint Locker Area), Naval Weapons Station, Seal Beach. According to Federal Facility Site Remediation Agreement (FFSRA) section 7.7 (c), the Navy is required to contact the agencies that failed to respond and again solicit their inputs. Please note that ARARs analysis is an iterative process. At the time of developing Remedial Action Plan (RAP)/ Removal Action Work plan (RAW), additional ARARs may be apparent.

In response to your request, we solicited action-specific, chemical specific and location specific ARARs from the following state and local agencies:

California Department of Health Services;
California Coastal Commission;
California Integrated Waste Management Board;
California Regional Water Quality Control Board, Santa Ana Region;

California Department of Fish and Game;
California Department of Transportation (District 12);
South Coast Air Quality Management District;
Native American Heritage
California Air Resources Board;
California State Lands Commission;
Orange County Sanitation District;
Orange County Water District;
Orange County Health Care Agency;
City of Seal Beach Environmental Quality Control Board

We received responses from California Air Resources Board, South Coast Air Quality Management District, California Department of Fish and Game, City of Seal Beach Environmental Quality Board. The responses are enclosed as Attachment A.

If you have any questions, please call me at (714) 484-5446.

Sincerely,

Katherine K. Leibel
Remedial Project Manager
Federal Facilities Unit "B"
Southern California Operations Branch

Enclosure

cc: Ms. Pei-Fen Tamashiro (w/o enclosure)
Naval Weapons Station, Seal Beach, Bldg. 110
800 Seal Beach Boulevard
Seal Beach, California 90740-5000

Mr. Si Le (w/o enclosure)
Southwest Division
Naval Facilities Engineering Command
1220 Pacific Coast Highway
San Diego, California 92132-5190

cc: Mr. Patricia Hannon (w/o enclosure)
California Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, California 92501-3339

ATTACHMENT A

South Coast
Air Quality Management District
AQMD
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

September 23, 2004

Department of Toxic Substances Control
Office of Military Facilities
5796 Corporate Avenue
Cypress, Ca 90630

Attn: Katherine K Leibel
Remedial Project Manager

The AQMD appreciates your request for input into compiling Applicable or Relevant and Appropriate Requirements (ARAR's), pursuant to SARA, for the Proposed non-time critical removal action at Site 42, Site 44/45, SWMU57, Seal Beach Naval Weapons Station (NWS), Seal Beach, California, as stated in your letter dated August 31, 2004

The following AQMD Rules and Regulations should be incorporated in the ARAR's.

Regulation IV - Prohibitions

Rule 401 - Visible Emissions
This rule limits any visible emissions from any single source to less than Ringlemann No. 1 or 20 percent opacity for 3 minutes in any hour (Ref. Health and Safety Code 41701).

Rule 402 - Nuisance
This rule prohibits the discharge of any air contaminant or other material (including odorous compounds) that causes injury or annoyance to the public, endangers the comfort, repose, health or safety of the public or causes damage to business or property. In general, a notice of violation may be issued upon receipt of six verified complaints or for any property damage or personal injury (Ref. Health and Safety Code 41700).

Rule 403 - Fugitive Dust
This rule limits on site activities so that the concentrations of fugitive dust at the property line shall not be visible. In addition, PM10 levels shall not exceed 50 micrograms per cubic meter as determined by the difference between upwind and downwind samples collected on high volume particulate matter samplers. These requirements do not apply if the wind gusts exceed 25 miles per hour. The rule also requires every reasonable precaution to minimize fugitive dust and the prevention and cleanup of any material accidentally deposited on paved streets. This rule shall not apply during life-threatening situations or during a declared disaster or state of emergency.

201 Permit to Construct
203 Permit to Operate
402 Nuisance
403 Fugitive Dust
1166 Volatile Organic Compound Emissions from Decontamination of Soil
1401 New Source Review of Carcinogenic Air Contaminants

In addition, the California Ambient Air Quality Standards (CAAQS, list enclosed) may apply as chemical specific ARARs. This is to ensure that activities undertaken to remediate these sites do not cause ambient air concentrations above the health protection levels of the CAAQS. If soil removal is necessary, the CAAQS for particulate matter (PM10) and lead should be considered.

If you have questions, please call Mr. Lynn Baker of my staff at (916) 324-6997.

Enclosure

cc: Mr. Jay Chen (w/o Enclosure)
Manager
Toxics Section
South Coast AQMD
21865 East Copley Drive
Diamond Bar, CA 91765

Mr. Lynn Baker
Staff Air Pollution Specialist
Substance Evaluation Section

Rule 404 - Particulate Matter
This rule limits equipment from discharging particulate emissions in excess of 0.01 to 0.196 grain per cubic foot based on a given volumetric (dry standard cubic feet per minute) exhaust gas flow rate averaged over one hour or one cycle of operation. It excludes steam generators or gas turbines.

Rule 405 - Solid Particulate Matter
This rule limits equipment from discharging particulate emissions in excess of 0.99 to 30 pounds per hour based on a given process weight.

Rule 407 - Liquid and Gaseous Air Contaminants
This rule limits equipment from discharging carbon monoxide emissions in excess of 2000 ppm and sulfur dioxide emissions of 500 ppm or greater averaged over 15 minutes. It excludes stationary internal combustion engines, propulsion of mobile equipment or emergency venting.

Rule 408 - Circumvention
This rule prohibits a person from building, erecting, installing or using any equipment, the use of which reduces or conceals an emission which would otherwise constitute a violation of these rules or Chapter 3 (starting with 41700) of Part 4, of Division 26 of the Health and Safety Code.

Rule 409 - Fuel Combustion Contaminants
This rule limits the emissions of particulate matter from the exhaust of a combustion source (such as a gas turbine) to 0.23 grams per cubic meter (0.1 grains per standard cubic foot) at 12 percent CO2 averaged over 15 minutes. It excludes internal combustion engines.

Rules 431.1, 431.2, 431.3 - Sulfur Content of Gaseous, Liquid or Fossil Fuels
These rules limit sulfur compounds from combustion of gaseous fuels not to exceed 40 ppm, 0.05 percent by weight for liquid fuels and 0.56 pounds of sulfur per million BTU for solid fossil fuels.

Rule 474 - Fuel Burning Equipment-Oxides of Nitrogen
This rule limits the concentration of oxides of nitrogen (as NO2) averaged over 15 minutes, from any non-mobile fuel burning equipment, to a range of 125 to 300 ppm for gaseous fuels and 225 to 400 ppm for solid and liquid fuels depending on equipment size.

Regulation X - National Emission Standards for Hazardous Air Pollutants

This regulation implements the provisions of Part 61, Chapter I, Title 40 of the Code of Federal Regulations (CFR) under the supervision of the AQMD Executive Officer. It specifies emissions testing, monitoring procedures or handling of hazardous pollutants such as beryllium, benzene, mercury, vinyl chloride and asbestos.

Regulation XI - Source Specific Standards

Rule 1150 - Excavation of Landfill Sites
This rule states that no person shall initiate excavation of an active or inactive landfill without an Excavation Management Plan approved by the Executive Officer of AQMD. The Plan shall provide information regarding the quantity and characteristics of the material to be excavated and transported and shall identify mitigation measures including gas collection and disposal, baling, encapsulating, covering the material and chemical neutralizing.

Rule 1166 - Volatile Organic Compound Emissions from Decontamination of Soil
This rule limits the emissions of volatile organic compounds (VOCs) from contaminated soil to less than 50 ppm. For contaminated soil with 50 ppm or greater, an approved mitigation plan, describing removal methods and mitigation measures, must obtained from the District prior to proceeding with the excavation. Uncontrolled spreading of contaminated soil is not permitted.

Regulation XIII - New Source Review

This regulation applies to any new or modified equipment, which may cause the issuance of any non-attainment air contaminant, ozone depleting compound or ammonia. It requires all equipment to be constructed with BACT (Best Available Control Technology). For non-attainment emission increases, it requires the emission increases to be offset and substantiated with modeling that the equipment will not cause a significant increase in concentrations of non-attainment contaminants.

Regulation XIV - Toxics

Rule 1401 - New Source Review of Carcinogenic Air Contaminants
This rule specifies limits for cancer risk and excess cancer cases from new stationary sources and modifications to existing stationary sources that emit carcinogenic air contaminants. The rule establishes allowable emission impacts for all such stationary sources requiring new permits pursuant to AQMD Rules 201 or 203. Best Available Control Technology for Toxics (T-BACT) will be required for any system where a lifetime (70 years) maximum individual cancer risk of one in one million or greater is estimated to occur. Limits are calculated using risk factors for specific contaminants.

Best Available Control Technology (BACT) Guidelines document

This document was compiled by SCAQMD. Although a guideline, it set up BACT requirements for various types of equipment or process. BACT is determined on a permit-by-permit basis based on the definition of BACT. In essence, BACT is the most stringent emission limit or control technology that is:

- found in a state implementation plan (SIP), or
- achieved in practice, or
- is technologically feasible and cost effective.

For practical purposes, at this time, nearly all AQMD BACT determinations will be based on achieved in practice BACT because it is generally more stringent than BACT based on SIP, and because state law constrains AQMD from using the third approach.

If you have any questions regarding these regulations, please call Mr. Ted Kowalczyk at (909) 396-2592.

Very truly yours

Jay Chen
Senior Manager
Toxics and Waste Management Unit

JC:CT:TK

cc: Carol Coy
Mohsen Nazemi

Terry Tamminen
Agency Secretary

Air Resources Board

Alan C. Lloyd, Ph.D.
Chairman
1001 I Street • P.O. Box 2815
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Arnold Schwarzenegger
Governor

MEMORANDUM

TO: Katherine Leibel
Remedial Project Manager
Federal Facilities Unit "B"
Southern California Operations
Office of Military Facilities
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630

FROM: Jim Aguila, Manager
Substance Evaluation Section
Stationary Source Division

DATE: September 10, 2004

SUBJECT: APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR INSTALLATION RESTORATION SITE 42, SITE 44/45, AND SOLID WASTE MANAGEMENT UNIT 57 – SEAL BEACH NAVAL WEAPONS STATION

This memorandum is in response to your request for potential California "Applicable or Relevant and Appropriate Requirements" (ARARs) for proposed non-time critical removal actions at Installation Restoration site 42, site 44/45, and solid waste management unit 57 at the Seal Beach Naval Weapons Station. State law as codified in Health and Safety Code (Division 26, section 40000) provides to local and regional authorities the primary responsibilities for control of air pollution from sources other than emissions from motor vehicles. Air pollution control districts and air quality management districts are required to adopt and enforce rules to achieve or maintain the state and federal ambient air quality standards in all areas affected by emission sources under their jurisdiction.

Rules and regulations of the South Coast Air Quality Management District (SCAQMD) should be included in the consideration of action specific ARARs for these sites. If you have not contacted the SCAQMD, we recommend that you contact Mr. Jay Chen, Manager, Toxics Section, at (909) 396-2664. SCAQMD rules that may apply include:

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM10, PM2.5, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calender year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.

8. New federal 8-hour ozone and fine particulate matter standards were promulgated by U.S. EPA on July 18,1997. Contact U.S. EPA for further clarification and current federal policies.

9. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		Federal Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	0.12 ppm (235 µg/m^3) [8]	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	—		0.08 ppm (157 µg/m^3) [8]		
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		50 µg/m^3		
Fine Particulate Matter (PM2.5)	24 Hour	No Separate State Standard		65 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15 µg/m^3		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	—
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	—	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.25 ppm (470 µg/m^3)		—		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	—	Ultraviolet Fluorescence	0.030 ppm (80 µg/m^3)	—	Spectrophotometry (Pararosaniline Method)
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (365 µg/m^3)	—	
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	1 Hour	0.25 ppm (655 µg/m^3)		—	—	—
Lead [9]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride [9]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

See footnotes on next page ...

State of California

Memorandum

Flex your POWER

To: Ms. Katherine Leibel
Office of Military Facilities
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA 90630

Date: September 28, 2004

From: Charlie Huang, Ph.D.
Staff Toxicologist
California Department of Fish and Game
Office of Spill Prevention and Response
Scientific Division
1700 K Street, Suite 250
Sacramento, CA 95814

Subject: **Applicable or Relevant and Appropriate Requirements (ARARs) for Site 42, Site 44/45. SWMU 57, Seal Beach Navel Weapons Station (NWS), California**

This memo is in response to your August 31, 2004, letter requesting potential State ARARs for Site 42, Site 44/45, SWMU 57 (Solid Waste Management Unit) at Seal Beach NWS. The Department of Fish and Game, Office of Spill Prevention and Response (DFG-OSPR) appreciates this opportunity to provide State laws and regulations to guide the planned cleanup at Seal Beach NWS.

It is our understanding that the Navy is making the request for ARARs for the purpose of ensuring a coordinated cleanup effort. The request for DFG-OSPR to define appropriate State cleanup requirements is made pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as a portion of the RI/FS process. This memo will serve to advise you of the DFG's continuing interest in coordinating any natural resource issues, as the designated natural resource trustee for the State of California. This may be necessary should release(s) of any hazardous materials at the subject site affect State natural resources.

The Seal Beach NWS is an active base located approximately 26 miles south of Los Angeles, consisting of about 5000 acres of land along the Pacific Coast within the city of Seal Beach in Orange County, California. Seal Beach NWS is bordered on the southwest by Anaheim Bay. The cities adjacent to Seal Beach NWS include Long Beach, Seal Beach, Los Alamitos, Westminster, and Huntington Beach. Anaheim Bay and the associated salt marsh were designated as a National Wildlife Refuge (NWR) in 1964. On August 30, 1972, 200 additional upland acres were added to the NWR. Five avian species, classified as endangered by State and/or federal governments, inhabit Seal Beach NWS and associated wetland: the California least tern, the light-footed clapper rail, the peregrine falcon, the California brown pelican, and the Belding's savannah sparrow.

Site 42 has two main areas of concern: 1) the 1,500-gallon oil-water separator east of Building 236; and 2) discharges to the NWR from a storm water collection basin drainpipe. Potential removal action alternatives for Site 42 include no action, partial removal of impacted soil, and complete removal of impacted soil. The area of the impacted soil subject to removal

action is approximately 650 square feet. The depth of the removal area is expected to be approximately 3 feet. Therefore, the volume of impacted soil subject to a removal action may be approximately 72 cubic yards.

Site 44/45 is the area where drums of unused OTTO fuel were stored in a bermed area from the 1940s to the late 1970s. Potential removal action alternatives for Site 44/45 include no action, partial removal of impacted soil, and complete removal of impacted soil. The area of the impacted soil subject to removal action is approximately 2,860 square feet. The depth of the removal area is expected to be approximately 1 to 3 feet. Therefore, the volume of impacted soil subject to a removal action may be approximately 106 to 317 cubic yards.

SWMU 57 is in the vicinity of an existing paint locker located east of Building 59. The paint locker is currently not in use. Building 59 was used for missile maintenance from 1989 to 1996. Potential removal action alternatives for Site 59 include no action, partial removal of impacted soil, and complete removal of impacted soil. The area of the impacted soil subject to removal action is approximately 600 square feet. The depth of the removal area is expected to be approximately 1 to 3 feet. Therefore, the volume of impacted soil subject to a removal action may range from 22 to 67 cubic yards.

Listed on the enclosed table is a list of Fish and Game Code Sections which may apply as site-specific State ARARs or TBCs (to be considered) with the date of enactment or promulgation. The specific citation and explanation for each listed ARAR and TBC are also enclosed, in addition to applicable statutes and regulations.

The staff of the DFG-OSPR appreciates the opportunity to provide our ARARs. If you have any questions or need further information, please contact me at (916) 324-9805 or by e-mail at chuang@ospr.dfg.ca.gov.

Enclosure

Reviewer: Julie Yamamoto, Ph.D., Senior Toxicologist
Wendy Johnson, Staff Counsel

cc: Ms. Pei-Fen Tamashiro
Naval Weapons Station, Seal Beach
800 Seal Beach Blvd
Seal Beach, California 90740

Department of Fish and Game
Office of Spill Prevention and Response
Julie Yamamoto, Ph.D., Senior Toxicologistc
Wendy Johnson, Staff Counsel

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
For Sites 42, 44/45, and SMWU57

LOCATION	STANDARD	SPECIFIC CITATION	ARAR/TBC EXPLANATION
Aquatic habitat/species	Action must be taken if toxic materials are placed where they can enter waters of the State. There can be no release that would have a deleterious effect on species or habitat.	Fish and Game Code section 5650 (a), (b) & (f)	These code sections prohibit the deposition into state waters of, *inter alia*, petroleum products (section 5650(a)), factory refuse (section 5650(b)), and any substance deleterious to fish, plants or birds (section 5650(f)). These are substantive, promulgated environmental protection requirements. These requirements impose strict criminal liability on violators. (*People v. Chevron Chemical Company (1983) 143 Cal. App. 3d 50).* This imposition of strict criminal liability imposes a standard that is more stringent than federal law. The extent to which each subdivision of section 5650 is relevant and appropriate depends on the site characterization. Section 5650 makes it unlawful "to deposit in, permit to pass into, or place where it can pass into the waters of this state" enumerated substances as petroleum products, sawdust, wood shavings, factory refuse, or any other substances or materials that are deleterious to fish, plant life, or bird life. .
Wildlife Species	Action must be taken to prohibit the taking of birds and mammals, including the taking by poison	Fish and Game Code section 3005 (Stats. 1957, c. 456, p. 1353 section 3005)	This code section prohibits the taking of birds and mammals, including taking by poison. "Take" is defined by Fish and Game Code section 86 to include killing. "Poison" is not defined in the code. Although there is no state authority on this point, federal law recognizes that poison, such as Strychnine, may effect incidental taking. (*Defenders of Wildlife v. Administrator, Environmental Protection Agency (1989) 882. F. 2d. 1295).* This code section imposes a substantive, promulgated environmental protection requirement. Because the remediation of this site involves treatment of contaminants, this section appears to be applicable and relevant.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
For Sites 42, 44/45, and SMWU57

Rare native plants	Action must be taken to conserve native plants, there can be no releases and/or actions that would have a deleterious effect on species or habitat.	Fish and Game Code section 1908 (Added by Stats. 1977, c. 1181, p. 3869, section 8)	Section 1908 imposes a substantive requirement by forbidding any "person" to take rare or endangered native plants. California Code of Regulations Title 14 section 670.2 provides a listing of the plants of California that have been declared to be Endangered, Threatened or Rare. Fish and Game Code section 67 provides the definition of "person" as any natural person or any partnership, corporation, limited liability company, trust, or other type of association. Whether the federal government or contractors acting on behalf of the federal government would fall within that definition is a potential issue. To the extent that there are rare or endangered plants on site, section 1908 would be an ARAR.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
For Sites 42, 44/45, and SMWU57

Endangered Species	Action must be taken to conserve endangered species, there can be no releases and/or actions that would have a deleterious effect on species or habitat.	Fish and Game Code section 2080 (Added by Stats. 1984, c. 1240, section 2).	This section prohibits the take, possession, purchase or sell within the state, any species (including rare native plant species), or any product thereof, that the commission determines to be an endangered or threatened species, or the attempt of any of these acts. This section is applicable and relevant to the extent that there are endangered or threatened species in the area which have the potential of being affected if actions are not taken to conserve the species. This section prohibits releases and/or actions that would have a deleterious effect on species or their habitat. This section and applicable Title 14 regulations should be considered applicable, relevant, and appropriate due to the presence of the California least tern, the peregrine falcon, the California brown pelican, and the double-crested cormorant. *California Code of Regulations Title 14 sections 670.2* provides a listing the plants of California declared to be Endangered, Threatened or Rare. *California Code of Regulations Title 14 section 670.5* provides a listing of Animals of California declared to be endangered or threatened. *California Code of Regulations Title 14 section 783 et. seq.,* provides the implementation regulations for the California Endangered Species Act.
Wildlife/ domestic species	Action must be taken to prohibit the use of steel-jawed leghold traps	Fish and Game Code section 3003.1 (Prop. 4 section 1 approved Nov. 3, 1998, eff. Nov. 4, 1998)	This section prohibits the use of any body gripping trap and provides that it is unlawful for any person, including an employee of the federal government, to use or authorize the use of such device to capture any game mammal, fur bearing mammal, nongame mammal, protected mammal, or any dog or cat. This prohibition will not apply in the extraordinary case where the use of such a device is the only method available to protect human health and safety.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
For Sites 42, 44/45, and SMWU57

Fully protected bird species/habitat	Action must be taken to prevent the taking of fully protected birds	Fish and Game Code section 3511 (Added by Stats.1970, c. 1036, p. 1848 section 4)	This section provides that it is unlawful to take or possess any of the following fully protected birds: (a). American peregrine falcon (b). Brown Pelican (c). California black rail (d). California Clapper rail (e). California Condor (f). California least tern (g). Golden eagle (h). Greater sandhill crane (i). Light footed clapper rail (j). Southern bald eagle (k). Trumpeter swan (l). White-tailed kite (m). Yuma clapper rail Although some of the fully protected birds are not typically found in Sites 42, 44/45, and SMWU57, this statute will be considered Applicable and Relevant if any of the above mentioned fully protected birds or their habitat are found on or near the site.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
For Sites 42, 44/45, and SMWU57

Wetlands	Actions must be taken to assure that there is "no net loss" of wetlands acreage or habitat value. Action must be taken to preserve, protect, restore and enhance California's wetland acreage and habitat values.	Fish and Game Commission Wetlands Policy (adopted 1987) included in Fish and Game Code Addenda	This policy seeks to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat in California. Further, it opposes any development or conversion of wetland that would result in a reduction of wetland acreage or habitat value. It adopts the USFWS definition of a wetland which utilizes hydric soils, saturation or inundation, and vegetable criteria, and requires the presence of at least one of these criteria (rather than all three) in order to classify an area as a wetland. This policy is not a regulatory program and should be included as a TBC.
Fully Protected Mammals	Actions must be taken to assure that no fully protected mammals are taken or possessed at any time.	Fish and Game Code section 4700 (Added by Stats. 1970, c. 1036, p. 1848 section 6)	This section prohibits the take or possession of any of the fully protected mammals or their parts. The following are fully protected mammals: (a) Morro Bay kangaroo rat (b) Bighorn sheep except Nelson bighorn sheep (c) Northern elephant seal (d) Guadalupe fur seal (e) Ring-tailed cat (f) Pacific right whale (g) Salt-marsh harvest mouse (h) Southern sea otter (i) Wolverine Although some fully protected mammals are not typically found in Sites 42, 44/45, and SMWU57, this statute will be considered Applicable and Relevant if any of the above mentioned fully protected mammals or their habitat are found on or near the site.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
For Sites 42, 44/45, and SMWU57

Fully Protected Reptiles and Amphibians	Actions must be taken to prevent the take or possession of any fully protected reptile or amphibian.	Fish and Game Code section 5050 (Added by Stats. 1970, c. 1036, p. 1849, section 7)	This section prohibits the take or possession of fully protected reptiles and amphibians or parts thereof. The following are fully protected reptiles and amphibians: (a) Blunt-nosed leopard lizard (b) San Francisco garter snake (c) Santa Cruz long-toed salamander (d) Limestone salamander (e) Black toad Although some fully protected reptiles and amphibians are not typically found in Sites 42, 44/45, and SMWU57, this statute will be considered Applicable and Relevant if any of the above mentioned fully protected reptiles and amphibians or their habitat are found on or near the site.
Birds	Action must be taken to avoid the take or destruction of the nest or eggs of any bird	Fish and Game Code section 3503	This section prohibits the take, possession, or needless destruction of the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto.
Birds of Prey	Action must be taken to prevent the take, possession, or destruction of any birds-of prey or their eggs	Fish and Game Code section 3503.5 (Added by Stats. 1985, c. 1334, section 6)	This section prohibits the take, possession, or destruction of any birds in the orders of Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto. This section will be applicable and relevant if such species or their eggs are located on or near the site.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
For Sites 42, 44/45, and SMWU57

Nongame birds	Actions must be taken to prevent the take of nongame birds.	Fish and Game Code section 3800 (Added by Stats. 1971, c. 1470, p. 2906, section 13)	This section prohibits the take of nongame birds, except in accordance with regulations of the commission, or when related to mining operations with a mitigation plan approved by the department. This section further provides requirements concerning mitigation plans related to mining. This section is applicable and relevant if nongame birds or their eggs are located on or near the site and such species have not been included in the fish and wildlife conservation plan filed pursuant to the Federal Fish and Wildlife Conservation Act. Species included in the plan will be protected at the federal standard making this section an ARAR to the extent that it is more stringent than the federal standard of protection.
Fur-bearing mammals	Provides manners under which fur-bearing mammals may be taken	Fish and Game Code section 4000, et. Seq. (Stats. 1957, c. 456, p. 1380, section 4000)	This section provides that a fur-bearing mammal may be taken only with a trap, a firearm, bow and arrow, poison under a proper permit, or with the use of dogs.
Nongame mammals	Action must be taken to avoid the take or possession of nongame mammals	Fish and Game Code section 4150 (Added by Stats. 1971, c. 1470, p. 2907, section 21)	Nongame mammals are those occurring naturally in California which are not game mammals, fully protected mammals, or fur-bearing mammals. These mammals, or their parts, may not be taken or possessed except as provided in this code or in accordance with regulations adopted by the commission.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
For Sites 42, 44/45, and SMWU57

Nongame Animals	Action must be taken to avoid the take of nongame mammals except as provided in applicable regulations	Title 14 California Code of Regulations (hereinafter referred as C.C.R.) section 472 (effective 07/01/74)	This Regulation provides that nongame birds and mammals may not be taken. a). The following nongame birds and mammals may be taken except as provided in Chapter 6: English Sparrow, starling, coyote, weasels, skunks, opossum, moles and rodents (excludes tree and flying squirrels, and those listed as furbearers, endangered or threatened species); b). Fallow, sambar, sika, and axis deer may be taken concurrently with the general deer season. c). Aoudad, mouflon,tahr, and feral goats may be taken all year. d). American crows may be taken only under provisions of section 485 and by landowners or tenants, or person authorized by landowners or tenants, when American crows are committing or about to commit depredations upon ornamental shade trees, agricultural crops, livestock, or whildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance. If required by Federal regulations, landowners or tenants shall obtain a Federal migratory bird depredation permit before taking any American crows or authorizing any other person to take them. Although some of the nongame birds and mammals are not typically found in Sites 42, 44/45, and SMWU57, this statute will be Applicable and Relevant if any of the above mentioned nongame birds and mammals or their habitat are found on or near the site.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
For Sites 42, 44/45, and SMWU57

Tidal Invertebrates	Action must be taken to avoid the take or possession of mollusks, crustaceans, or other invertebrates	Fish and Game Code section 8500(Added by Stats. 1972, c. 1248, p. 2436. Section 2, eff. Dec. 13, 1972)	It is unlawful to possess or take, unless otherwise expressly permitted in this chapter, mollusks, crustaceans, or other invertebrates, unless a valid tidal invertebrate permit has been issued. The taking, possessing, or landing of such invertebrates pursuant to this section shall be subject to regulations adopted by the commission.
Protected Amphibians	Action must be taken to avoid the take or possession of protected amphibians.	Title 14 C.C.R. sections 40 (Section 40 designated effective 03/01/74)	This regulation makes it unlawful to capture, collect, intentionally kill or injure, possess, purchase, propagate, sell, transport, import, or export any native reptile or amphibian, or parts thereof unless under special permit from the department issued pursuant to Title 14 C.C.R. sections 650, 670.7, or 783 of these regulations, or as otherwise provided in the Fish and Game Code or these regulations.

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs
For Sites 42, 44/45, and SMWU57

Furbearing Mammals	Action must be taken to avoid take	Title 14 C.C.R. section 460 (effective 07/01/59)	Regulation makes it unlawful to take fisher, marten, river otter, desert kit fox, and red fox. Although some of the mammals are not typically found in Sites 42, 44/45, and SMWU57, to the extent that the Red Fox, which is highly possible to occur in the area, or it's habitat is found on or near Seal Beach NWS, this section will be an ARAR.
Furbearing Mammals	Provides methods of take for other furbearing mammals not listed in Title 14 C.C.R. section 460	Title 14 C.C.R. section 465 (effective 07/01/69)	Furbearing mammals not listed specifically in Title 14 C.C.R. section 460 and listed in 14 C.C.R. section 461, 462, 463, and section 464 may be taken only with a firearm, bow and arrow, or with the use of dogs, or traps in accordance with the provisions of Section 465.5 of Title 14 and section 3003.1 of the Fish and Game Code. Although these mammals may not be currently present in Sites 42, 44/45, and SMWU57, if one is found on or near Sites 42, 44/45, and SMWU57 at some future date, this section will become applicable and relevant.

City of Seal Beach

CITY HALL 211 EIGHTH STREET
SEAL BEACH, CALIFORNIA 90740
(562) 431-2527 • www.ci.seal-beach.ca.u

BY FACSIMLE TO (714) 484-5437
AND FIRST CLASS MAIL

September 29, 2004

Department of Toxic Substances Control
Attn: Katherine K. Leibel, Remedial Project Manager
Federal Facilities Unit "B", Office of Military Facilities
Southern California Operations
5796 Corporate Avenue
Cypress, CA 90630

Dear Ms. Leibel:

SUBJECT: **CITY OF SEAL BEACH RESPONSE RE: ARARs for IR SITES 42, 44/45, AND SWMU 57, SEAL BEACH NAVAL WEAPONS STATION**

The City of Seal Beach has reviewed your request of August 31, 2004 relative to "*Request for Applicable or Relevant and Appropriate Requirements*" (ARARs) for Naval Weapons Station (WPNSTA), Seal Beach, Sites 42, 44/45, and SWMU 57. Upon a review of your letter, the information provided in Attachment A, and the attached EPA Fact Sheet "*Overview of ARARs*", the City of Seal Beach has no input on potential ARARs regarding chemical-specific ARARs. The City does have a "***relevant and appropriate requirement***" in relation to all of the sites. The City requests that all requirements of South Coast Air Quality Management District Rule 402, Nuisances, and Rule 403, Fugitive Dust, be incorporated into the remediation program for all sites, due to the close distance to existing residential areas.

In addition, since there are agreements between the Navy and the State of California which require the Installation Restoration Program to comply with State requirements and regulations, all project activities would be determined a project pursuant to California Public Resources Code Section 21065, and therefore would require an environmental analysis to be performed in accordance with the provisions of the California Environmental Quality Act, Section 21000 et. seq., and the "Guidelines for the Implementation of the California

Environmental Quality Act with Discussions", prepared by the Governors Office of Planning and Research.

Thank you for allowing us to comment on the proposed ARARs for Naval Weapons Station, Seal Beach, Site 42, Site 44/45 and SWMU 57. If you have any questions or require further information, please contact Mr. Lee Whittenberg, Director of Development Services Department, (310) 431-2527, extension 313, at your earliest convenience. He will be able to respond to any additional questions that you may have regarding this matter.

Sincerely,

Mario Voce

Mario Voce
Chairman, Environmental Quality Control Board

cc: City Council
Environmental Quality Control Board

City Manager
Director of Development Services Department

California Regional Water Quality Control Board

Santa Ana Region

Terry Tamminen
Secretary for Environmental Protection

3737 Main Street, Suite 500, Riverside, California 92501-3348
(951) 782-4130 • Fax (951) 781-6288
http://www.waterboards.ca.gov/santaana

Arnold Schwarzenegger
Governor

October 12, 2004

Mr. Si Le
Southwest Division, Naval Facility Engineering Command
1220 Pacific Highway
San Diego, CA 92132-5190

REGIONAL WATER QUALITY CONTROL BOARD (RWQCB) APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs) FOR IR SITES 42 (AUTO SHOP SUMP/WASTE OIL TANK), 44/45 (FORMER WASTE OTTO FUEL DRUM STORAGE/BUILDING 88 DRAIN OUTLET) AND SWMU 57 (PAINT LOCKER AREA), U. S. NAVAL WEAPONS STATION, SEAL BEACH

Dear Mr. Le:

On September 24, 2004, we received your requests for ARARs for a proposed non-time critical removal action at IR Sites 42, 44/45 and SWMU 57 at U. S. NWS Seal Beach, in compliance with Section 121 (d) (2) (A) of CERCLA and the National Contingency Plan 40 CFR Section 300.400 (g) and 300.515(d) and (h). The following is a list of our ARARS:

- **Water Quality Control Plan Santa Ana River Basin 1995 (Basin Plan)**

Citation: Chapter 3, Beneficial Uses

Description: Defines beneficial uses for groundwater beneath NWS Seal Beach as municipal, agricultural, industrial service and industrial process supply.

Comments: The identification of the groundwater as a potential drinking water source forms a basis for selection of concentration limits, cleanup levels and treatment levels.

ARAR Status: Applicable, Action

Citation: Chapter 4, Water Quality Objectives

Description: Defines the groundwater quality objectives for non-degradation, taste and odor, bacteria, chemical constituents, toxic substances, radioactivity and minerals.
Comments: Applies to all cleanups of discharges that may affect water quality.

ARAR Status: Applicable, Action, Chemical

- **Statement of Policy with Respect to Maintaining High Quality of Waters in California**

Citation: State Water Resources Control Board Resolution No. 68-16

Description: Establishes policy on maintaining the high quality of California's surface waters and groundwater.

Comments: Applies to discharges of waste to waters of the State, including discharges to soil that may affect surface or groundwater. In-situ cleanup levels for contaminated soils must be set so that groundwater will not be degraded, unless degradation is consistent with the maximum benefit to the people of the State. If degradation is allowed, the discharge must meet standards for best practical treatment or control, and must result in the highest water quality possible, consistent with the maximum benefit to the people of the State. In no case may water quality objectives be exceeded.

ARAR Status: Applicable, Action, Chemical, Location

- **Sources of Drinking Water Policy**

Citation: State Water Resources Control Board Resolution No. 88-63 and Regional Board Resolution No. 89-42.

Description: Defines all groundwater and surface waters as existing or potential sources of drinking water, with a few specified exceptions (these exceptions are specified in Chapter 3, Beneficial Uses of the Basin Plan).

Comments: The identification of the groundwater beneath Sites 42, 44/45 and SWMU 57 as potential sources of drinking water provides information to determine concentration limits, cleanup levels and treatment levels.

ARAR Status: Applicable, Location

- **Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304**

Citation: State Water Resources Control Board Resolution No. 92-49 (as Amended April 21, 1994 and October 2, 1996).

Description: Requires the investigation, cleanup and abatement to extend to any location affected by a discharge or threatened discharge, and sets policies and procedures for all investigations and cleanup and abatement activities.

Comments: These policies and procedures are applicable to investigations and remedial activities at Sites 42, 44/45 and SWMU 57.

ARAR Status: Applicable, Action, Chemical, and Location

- **Porter-Cologne Water Quality Control Act 1998**

Citation: California Water Code Section 13000

Description: Defines the legislative intent to attain the highest water quality reasonable, considering all demands being made.

Comments: Basis for selection of background levels as the goal for cleanup criteria.

ARAR Status: Applicable, Action

Citation: California Water Code Section 13176

Description: Requires that the analysis of material be performed in a State-certified laboratory.

Comments: Applies to all investigations and remedial actions.

ARAR Status: Applicable, Action

Citation: California Water Code Chapter 4, Article 4

Description: Requires the submission of information regarding waste discharges, and states that requirements shall be placed to implement water quality control plans. Technical or monitoring reports may be required for investigation of water quality. Provides for penalties for noncompliance.

Comments: Removal and remedial actions must comply with substantive requirements.

ARAR Status: Applicable, Action, Chemical, Location

Citation: California Water Code Chapter 5, Article 1

Description: Requires cleanup and abatement of conditions of pollution or nuisance or threatened pollution or nuisance.

Comments: Applies to all investigation and remedial actions.

ARAR Status: Applicable, Action

Citation: California Water Code, Chapter 10, Article 3

Description: Specifies the requirements for water wells, monitoring wells, and cathodic protection wells.

Comments: Applies to all well installations.

ARAR Status: Applicable, Action

Citation: California Water Code Sections 13240, 13241, 13242, 13243

Description: Establishes water quality objectives, including narrative and numerical standards, that protect the beneficial uses of surface waters and groundwater in the Region. Describes control measures designed to ensure compliance with State plans and policies, and provides comprehensive water quality planning. Includes implementation actions for setting soil cleanup levels for soils that threaten water quality.

Comments: Any activity, including a new discharge of contaminated soils or containment of contaminated soils, that may affect water quality, must not result in exceeding water quality objectives. Implementation plans and other policies and requirements may apply.

ARAR Status: Applicable, Action

- **Discharges of Waste to Land**

Citation: California Code of Regulations, Title 27, Sections 20200(c) and 20210

Description: Requires that designated waste be discharged to Class I or Class II waste management units.

Comments: Applies to discharges of designated waste (non-hazardous waste that could cause degradation of surface or ground water) to land for treatment, storage, or disposal.

ARAR Status: Applicable, Action

Citation: California Code of Regulations, Title 27, Section 20230

Description: Specifies that inert waste does not need to be discharged at classified units.

ARAR Status: Applicable, Action

Citation: California Code of Regulations, Title 27, Sections 20200(c), 20220

Description: Requires that non-hazardous solid waste be discharged to a classified waste management unit.

Comments: Applies to discharges of non-hazardous solid waste to land for treatment, storage or disposal.

ARAR Status: Applicable, Action

- **Storm Water Activities**

Citation: 40 CFR, Parts 9, 122, 123, 124, National Pollutant Discharge Elimination System, implemented by the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit), Water Quality Order No. 99-08-DWQ,

Comments
Construction and earth-moving activities that result in disturbance of at least one acre are subject to Water Quality Order No. 99-08-DWQ and the NPDES General Permit for Storm Water Discharges Associated with Construction Activity. Such activities include, but are not limited to, clearing, grading, stockpiling and excavation of soil or other materials.

ARAR Status: Applicable, Action

If you should have any questions regarding the details of the ARARs listed in this letter, please call me at (951) 782-4498 or send e-mail to phannon@waterboards.ca.gov.

Sincerely,

Patricia A. Hannon
SLIC/DoD Section

cc sent electronically: Ms. Katherine Liebel, Dept of Toxic Substances Control
Ms. Pei-Fen Tamashiro, U. S. NWS Seal Beach

TABLE OF CONTENTS

ACRONYMS/ABBREVIATIONS

EE/CA	Engineering Evaluation/Cost Analysis
O&M	Operation and maintenance
RACER 2001	Remedial Action Cost Engineering and Requirements 2001 System
UPB	Unit Price Book
EPA	United States Environmental Protection Agency

B1.0 INTRODUCTION

The cost estimate presented in this Engineering Evaluation/Cost Analysis (EE/CA) was developed according to guidance in the National Oil and Hazardous Substance Pollution Contingency Plan and the Remedial Action Costing Procedures Manual (U.S. EPA 1987) using the Remedial Action Cost Engineering and Requirements 2001 (RACER 2001) System developed by the United States Environmental Protection Agency (EPA) and the United States Air Force, and cost information from other site assessment and removal/remedial activities conducted at Naval Weapons Station Seal Beach. A description of the RACER cost system is provided below.

B1.1 DESCRIPTION OF RACER

RACER cost models are based on generic engineering solutions for environmental projects, technologies, and processes. The generic engineering solutions were derived from historical project information, government laboratories, construction management agencies, vendors, contractors, and engineering analysis. RACER 2001 incorporates the most technologically up-to-date engineering practices and procedures to accurately reflect today's removal/remediation processes and pricing. When an estimate is developed in RACER 2001, generic engineering solutions are tailored by adding site-specific parameters to reflect the project-specific conditions and requirements. The tailored plan is then translated into specific quantities of work items priced using the current cost data. The RACER assembly cost database was developed from the United States Army Corps of Engineers Unit Price Book (UPB) and supplemented by vendor and contractor quotes. RACER 2001 incorporates and summarizes cost by the code of accounts that was developed by the interagency Cost Estimating Group for Hazardous, Toxic and Radiological Waste Remediation.

RACER 2001 costs are location-specific, using factors to modify costs in the database for the site-specific geographic location. Included with the direct cost is an estimate for professional labor support to this removal action. This support is calculated on the basis of the technology being used and covers the costs associated with construction oversight and preparation of work plans (e.g., Safety and Health Plan, Quality Assurance Project Plan). Indirect cost estimates for the removal action include items such as sales tax, contractor overhead, contractor profit, bonds, and insurance costs.

The cost estimates have a ±30 percent accuracy and are escalated from November 2001 to the midpoint of the project using escalation rates from the Remediation Cost Escalation Table published by the Office of the Secretary of Defense. Cost estimates prepared for this EE/CA can increase during the design and/or implementation phases as a result of unforeseen conditions or items not reflected in the conceptual plans. Contingency has been added to the total direct and indirect capital costs and escalation has been added at a rate of 15 percent to cover cost increases that may occur as a result of these unforeseen conditions or changes.

B1.2 COST-ESTIMATE COMPONENTS

Cost estimates for the removal action alternatives include direct and indirect capital costs and operation and maintenance (O&M) costs, if applicable. Direct capital costs may include detailed design/engineering (removal design), construction, construction materials, revegetation, direct labor, equipment, removal action oversight (removal action professional labor), and maintenance and reporting. Indirect capital costs may include contractor general conditions, prime and subcontractor overhead and profit, taxes, bonds and insurance, prime contractor home office costs, and overhead associated with professional labor. O&M costs include site inspections, maintenance, auxiliary materials, administration, and purchased services, operating labor, postclosure maintenance, energy costs, environmental monitoring, testing and analysis, and postclosure site inspections.

Total direct and indirect costs for estimated capital and O&M costs are escalated in an Microsoft® Excel spreadsheet cost summary at a rate of 5 percent per year based on November 2004 costs. The escalated costs are shown to present actual future costs based on today's dollar.

B1.3 GENERAL ASSUMPTIONS

The following assumptions were made for calculating present worth:

- inflation or escalation rate – 5 percent per year for the duration of O&M annual expenditures
- period of performance – (project duration) months including construction

The following general assumptions were made to develop the cost estimate.

- There are no O&M costs.
- The site is generally accessible. Specialized equipment will not be required to complete the work.
- Work plan preparations, safety and health plan, technical oversight during planning, and implementation of work are included in the cost for professional labor. Level D personal protective equipment was assumed for the professional labor/removal action oversight costs for all alternatives.
- Contingencies are 15 percent of direct capital cost, indirect capital cost, and O&M costs.

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Project Title: Engineering Evaluation/Cost Analysis
Non-Time Critical Removal Action
Installation Restoration (IR) Site 42
Naval Weapons Station Seal Beach
Seal Beach, CA
May 27, 2005

Comment No.	Page No./ Section	Comment	Response
Reviewer: Charlie Huang, Ph.D – DFG – OSPR Comments dated: July 15, 2005			
1		The DFG-OSPR appreciates this opportunity to provide guidance on the planned cleanup at IR Site 42, Seal Beach NWS. This memo will serve to advise the Navy of our continuing interest in coordinating any natural resource issues, as one of the designated State natural resource trustees. This may be necessary should release(s) of any hazardous materials at the subject site affect State natural resources.	Comment noted. No response required.
2		Page 22, Section 3.5. It is stated that, based on the upper limit background value, the proposed cleanup goal in soil is 39 mg/kg. DFG-OSPR concurs with the recommended removal action alternative, and the proposed cleanup goal to ambient condition for copper.	Comment is noted, no response needed.
3		Numerous marine and terrestrial birds and waterfowl may frequent the NMR. The Navy should avoid jeopardizing any birds during the removal action. For example, the site is about 150 feet from the NWR (Section 2.1.1, Page. 5), which is potentially within the Western Snowy Plover's foraging distance from the nest for females 177 m (580 feet) and males 272 m (892 feet) (Cal/Ecotox Database, http://www.oegga.org/cal_ecotox/). If at any time during this removal action any bird is harmed and/or killed, the DFG-OSPR requests that the bird be collected and that a DFG-OSPR biologist in our Los Alamitos Office be contacted (Corey Kong at 562-598-6203 or Christopher Thixton at 562-598-4052).	Comment noted. A portion IRP Site 42 is located inside the Seal Beach National Wildlife Refuge. The Navy will work with the Refuge Manager of the US Fish and Wildlife Service to ensure that project activities at the site will not jeopardize any birds during the removal action. It is highly unlikely that any

Project Title: Engineering Evaluation/Cost Analysis
Non-Time Critical Removal Action
Installation Restoration (IR) Site 42
Naval Weapons Station Seal Beach
Seal Beach, CA
May 27, 2005

Comment No.	Page No./ Section	Comment	Response
			terrestrial birds or waterfowl will be impacted by the removal action however, if any bird(s) are harmed and/or killed because of the removal action, the Navy will collect the avian receptor and one of the DFG-OSPR biologists listed will be contacted.
4		The document does not include all of the DFG ARARs (Section A5.0, pg.A-43), and the discussion of the various alternatives does not contain analysis of whether or not the alternative is consistent with these ARARs (Section 5.3.2.1, pg. 36). We provided a list of Fish and Game Code Sections which may apply as site-specific State ARARS or TBCs (to be considered) on September 28, 2004, however for example, Fish and Game Code section 5650 was not included in the discussion of the EE/CA. Fish and Game Code 5650 prohibits depositing of placing where it can pass into waters of the State any substance deleterious to fish, plant life or bird life. Please provide this analysis in the Final EECA.	Comment noted. Pg.A-43 Section A5.0 has been revised to include all the applicable DFG ARARs. Also, Sections 5.2.1.1, 5.2.1.4, 5.3.1.1, and 5.3.2.1 have been revised to include discussion of the ARARs for the various alternatives.

Comment No.	Page No./ Section	Comment	Response
Reviewer: Patricia Hannon – RWQCB Santa Ana Region Comments dated: September 27, 2005			
1	Page 15 3rd paragraph	The text states: "Groundwater contamination is also unlikely because the groundwater is likely to be brackish due to the proximity of the site to the saline waters of the salt marsh." The fact that the groundwater is brackish does not protect it from becoming contaminated. Please rephrase this sentence.	Comment noted. Text will be rephrased to read: "Human health risk from the groundwater is also anticipated to be unlikely because of the brackish nature due to the proximity of the site to the saline waters of the salt marsh and tidal influence."
2	Figure 1-1 IR Site 42 Site Map	This figure shows that, the 1500-gallon oil/water separator located near Building 236 discharges to the wetland. The text on page 2 states that the oil/water separator is in use and discharges to a sanitary sewer. Please clarify where the oil/water separator discharged in the past and where it is currently discharging, and add the sanitary sewer line to the site map.	Figure 1-1 has been corrected. The oil/water separator was removed during the first quarter of 2004. The clarifier previously discharged to the sanitary sewer which runs parallel to, and on the west side of Kitts Highway in roughly a north/south direction. The sanitary sewer line will be added to Figure 1-1 and the connection to the clarifier will be corrected. Text in the EE/CA will be changed

Comment No.	Page No./ Section	Comment	Response
			to read "The maintenance shop oil-water separator began operation in 1978 and was removed in early 2004. It separated floatable oil from wastewater generated from Building 236. The clarified wastewater was discharged to a sanitary sewer pipe located west of Kitts Highway."
3	Table 2-1 Summary Statistics for Analytes Reported in Soil Samples Collected During the FSI Phase II	Please explain what the "N" after a maximum concentration means.	The "N" is a qualifier which indicates "Spiked sample recovery not within control limits". This qualifier was noted in the Qualifier Descriptions portion of Appendix H "Laboratory Results" of the Phase II SI Report dated 28 January 2002 prepared by CH2M HILL. An appropriate footnote will be added to Table 2-1.